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PLANTS

OF THE

COAST OF COROMANDEL;

SELECTED FROM

DRAWINGS AND DESCRIPTIONS,

PRESENTED TO

THE HON. COURT OF DIRECTORS OF THE EAST INDIA COMPANY.

BY

WILLIAM ROXBURGH, M. D.

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201. CURCUMA ZERUMBET.

Root tuberous. *Leaves* elliptic, acute, clouded, smooth, petioled on their sheathing bases. *Spike* radical, appearing before the leaves.

Amomum latifolium. *Lamarck Encyclop.* 1. *p.* 133.
Amomum Zerumbeth. *Kœnig in Retz. Observ.* 3. *p.* 55.
Kua. *Rheed. mal.* 11. *t.* 7.
Zerumbed. *Rumph. amb.* 5. *p.* 168. *t.* 68.
Karchoora and Gandhamoolaka, are two of its numerous Sanscrit names.
Kutchoor, Catchoor, or Cachoraa of the Telingas.
Sotee of the Bengalese, also Huridra.
Zerumbad of the Persians.

Root perennial, tuberous, about as thick as a man's thumb, as in ginger, with many, long, fleshy, whip-cord-like fibrous ramifications, issuing chiefly from the crown of the tuberous part of the root, and base of the stems and scapes; these descend deep into the ground, and are often furnished with simple, ovate-oblong tubers, at a considerable depth below the first mentioned horizontal superficial tubers. The substance of the first or superficial tubers, is of a firm fleshy nature; outwardly of a light grey, and inwardly of a pale straw colour; they possess an agreeable fragrant smell, and warm, bitterish, aromatic taste. The oblong, more remote tubers, are of a more spongy nature, and possess less aroma.

Stem, no other than the united sheaths of the leaves, surrounded by two or three obtuse, smooth, green, faintly-striated, appressed scales. Height of the whole plant about three, or three and a half feet.

Leaves from four to six together; in general a pretty long, somewhat winged petiol intervenes between each, and its stem forming base. The leaf itself is elliptic, fine-pointed, and smooth on both sides, constantly purple in the centre; veins numerous, small, and parallel; length from one to two feet.

Scape rises distinct from the leafy stems, and generally before them, about five or six inches long, and surrounded with a few obtuse lax sheaths, of various lengths.

Spike tufted, four or five inches long (so that its apex is elevated nearly a foot above the surface of the earth), imbricated with oblong, concave bractes, united by the lower half of their inner margins, to the backs of those immediately above; forming as many pouches as there are bractes; about the middle and base of the spike these are broader, shorter, scarcely tinged with red, and contain about three or four beautiful, yellow, sessile flowers each, which expanding in succession, are embraced laterally by their own proper, smaller, short, colourless bractes. The superior bractes, which form the upper part of the spike and tuft, are generally sterile, and of a deep crimson, or purple colour, or a mixture of these.

Calyx above, scarce one-third the length of the corol, irregularly three-toothed, semi-pellucid.

Corol funnel-shaped. *Tube* a little curved, gradually widening. *Border* double: *Exterior* three-parted: the two lateral segments equal; the third, or upper one, vaulted, and crowned with a subulate point; colour a very faint yellow. *Interior* two-parted: lower segment (or lip) broad, deep-yellow, projecting, recurved, two-parted; upper segment of two lateral, obovate, equal, pale yellow segments, nearly as long as the length of the lower lip; and between them a third which is shorter and narrow, supporting the anther, and may therefore be called the filament.

Anther two-lobed, the lower end of each ends in a long, sharp, subulate hornlet.

Germ beneath, hairy. *Style* slender, at the base embraced by the two nectarial filaments. *Stigma* two-lobed, crowning the anther.

It is a native of various parts of India; in Bengal, it generally blossoms in April.

The dried root of this plant agrees tolerably well with that called Zedoaria longa in Europe, but not with the drug there called Zerumbet.

The dry root powdered, and mixed with the powdered wood of Cæsalpinia Sappan, is called Abeer by the Telingas, and Paag by the Bengalese; it is copiously thrown about by the natives during the Hollee, or Hindoo holidays in the month of March. It is also used medicinally.

This is one of six species of Curcuma which I have figured, and described in India; all are plants of uncommon beauty. They have all tufted spikes, and calcarate anthers, which no other of this charming natural order, that I have yet met with, have; consequently these are the best marks to know the genus by.

202. GRATIOLA LUCIDA.

Linn. Spec. Plant. Edit. Willd. 1. *p.* 103.

Annual, with diffuse, four-sided branches. *Leaves* ovate-cordate, serrate. *Flowers* long-peduncled, axillary, and terminal. *Capsules* ovate, hid in the calyx.

Crusta ollæ minor. *Rumph. amb.* 5. *p.* 461. *t.* 170. *f.* 3.

Stem scarce any, but several opposite, four-sided, smooth branches, and branchlets, spread on the surface of the ground; their length from six to twelve inches.

Leaves opposite, petioled, ovate-cordate, serrate, smooth.

Flowers terminal, and from the exterior axills, long-peduncled, bright, deep blue colour.

Capsule ovate, shorter than the calyx.

A native of low, moist places over India. Appears during the rains, and blossoms in July, August, and September.

203. GRATIOLA PARVIFLORA.

Annual, erect, ramous, four-sided. *Leaves* opposite, ovate-oblong, three-nerved, serrulate, acute. *Flowers* long-peduncled, solitary. *Sterile* filaments two-cleft. *Capsules* longer than the calyx, acute.

Stems erect, with few, opposite, acutely four-angled branches; general height about six inches.
Leaves opposite, sessile, ovate-oblong, serrulate, three-nerved, acute, smooth.
Flowers axillary, solitary, long-peduncled, small, general colour blue, though I have seen many plants with white flowers.
Steril Filaments two-cleft: divisions capitate.
Capsule oblong, pointed, longer than the calyx.

Is also a native of low, moist places over India, where it appears, and blossoms during the rains.

204. GRATIOLA ROTUNDIFOLIA.

Linn. Spec. Plant. Edit. Willd. 1. *p.* 103.

Annual erect, four-sided. *Leaves* sessile, round-cordate, serrate-dentate. *Peduncles* axillary, solitary, longer than the leaves. *Capsules* globular, length of the calyx.

With the two former species, this appears and blossoms during the rains, and continues in flower the first part of the cool season. Willdenow quotes Tsjanga-puspam, *Rheed. mal.* 9. *tab.* 57, for this delicate small species; but I have found another, which I call G. integrifolia, that I think agrees better with that figure than this.

205. HIPPOCRATEA ARBOREA.

Subarboreous, with weak subscandent branches. *Leaves* opposite, elliptic, serrulate, fine-pointed. *Corymbes* axillary, dichotomous. *Capsules* linear-oblong, two-seeded.

Cottæ-paharia of the Hindoos.

Trunk straight, about as thick as a man's arm, covered with smooth, dark brownish, ash-coloured bark. *Branches* and *branchlets* spreading, and tending to climb; young shoots round and smooth, indeed highly polished.
Leaves opposite, short-petioled, drooping, elliptic, fine taper-pointed, serrate, very smooth on both sides; six or seven inches long, and about three broad.
Stipules none, but two or three small, dark brown, scaly buds in each axil.
Corymbes axillary, dichotomous, with a pedicelled flower in the divisions.
Bractes opposite, small, permanent.
Flowers very numerous, very small, pale greenish-yellow.
Calyx beneath, generally four, though sometimes five, or even six-parted; divisions rounded, and only about half the length of the corol.
Corol four, five, or six-petalled; six is the most common, and I suspect the natural number, in a double series; equal, ovate-oblong, smooth.
Nectary: a three-sided, fleshy cup, surrounds the insertion of the stamina and germ.
Filaments three, membranaceous, shorter than the corol. *Anthers* four-lobed.
Germ ovate. *Style* short. *Stigma* simple.
Capsules three, linear-oblong, compressed, smooth, one-celled, two-valved: each valve boat-shaped.
Seeds two in the apex of each capsule, with a long, broad wing, extending to its base, where they are inserted.

A native of the interior parts of India, blossoms in July, and the seed ripen in March.

A small tree of five years growth, and about twelve feet in height (in the Botanic Garden at Calcutta), reared from seed, presented by Dr. Hunter, flowered in July 1802, for the first time.

206. PANICUM SQUARROSUM.

Retz. Obs. 4. *p.* 15 *and* 5. *tab.* 1. *Linn. Sp. Plant. Edit. Willd.* 1. *p.* 345.

Culms creeping. *Spikes* two, horizontal; *rachis* jointed. *Flowers* fascicled (from the upper end of each joint of the rachis). *Corol* three-valved.

Cenchrus muricatus. *Linn. Mant.* 302. *Schreb. gram.* 2. *p.* 69. *t.* 34.

Culms creeping to a considerable extent, with alternate spreading branches; their flower-bearing extremities ascending.
Leaves short, but rather broad, and covered with soft hairs. *Sheathes* large, involving much of the culms, downy.
Spikes two, terminal, spreading horizontally, or ascending in a curve, one-ranked. *Rachis* composed of from four to eight, thin, membranaceous, oblong joints; a waved ridge divides them longitudinally on the inside.
Flowers collected in sessile bundles, of from four to eight on the inside of the upper end of each joint of the rachis.
Calyx one-flowered, three-valved: the *exterior* minute, and lanceolate: the *second* large, acute, and striated; the *inner* nearly as small as the exterior, tapering from the base to a fine point, three-nerved, and fringed with a scariose border.

Is a native of the dry, sandy ground near the sea, on the Coast of Coromandel.

207. BOSWELLIA GLABRA.*

Canarium odoriferum. *Rumph. amb.* 2. *t.* 50.
Gugulapoo-tschittoo of the Telingas.

GENERIC CHARACTER.

Calyx five-toothed, inferior. *Corol* five-petalled. *Nectary*. a crenulate staminiferous cup, round the lower part of the germ. *Capsule* three-sided, three-celled, three-valved. *Seed* solitary, with a membranaceous wing.

* In memory of the late Dr. John Boswell, of Edinburgh.

DESCRIPTION.

Trunk erect, straight, and of a great height. *Bark* firm, pretty thick, and covered with a greenish ash-coloured tender pellicle. *Branches* few in proportion to the size of the tree.

Leaves about the extremities of the branchlets, alternate, unequally-pinnate, from six to twelve inches long. *Leaflets* sessile, from six to ten pair, opposite, broad-lanceolate, obtuse, rounded a little at the base, equal, slightly serrate, smooth, about an inch and a half long, and about half an inch broad.

Petioles round and smooth.

Stipules none.

Racemes terminal, many together, forming a panicle, downy, generally from three to six inches long.

Bractes minute.

Flowers numerous, short-pedicelled, small, white.

Calyx beneath, small, five-toothed, permanent.

Petals five, oblong, toward the base tapering, above spreading.

Nectary: a crenulate, fleshy, red ring surrounds most part of the germ.

Filaments ten, subulate, scarce half the length of the petals, spreading, alternately shorter; inserted on the outside of the base of the nectary. *Anthers* oblong, pointed, large.

Germ oblong. *Style* three-sided, as long as the filaments. *Stigma* headed, green.

Capsule about the size of small plum, three-sided, three-valved, three-celled, opening from the base.

Seeds one in each cell, cordate, surrounded with a broad membranaceous wing.

OBSERVATIONS.

A native of the highest mountains on the Coast of Coromandel, where it grows to be one of the largest trees; its leaves are deciduous about the end of the rains, in October. Flowering time the cool season, soon after the young leaves make their appearance.

The wood of this tree, being hard, heavy, and durable, together with its size, render it of great use for various purposes. The lower masts of coast-built vessels are generally made of it, though its weight renders it less fit than fir or teak, and still less so for top-masts.

From wounds made in the bark, a large quantity of resin exudes, which soon becomes hard and brittle, and is often used as a substitute for pitch on the Coast of Coromandel. To soften and render it fit for use, a certain portion of some low-priced vegetable oil, such as castor, or mustard oil, is boiled up with it. The finer pieces of this resin are frequently burnt, instead of common incense (benzoin), in the temples of the natives.

On the Balla-gaut mountains a second species grows, which I consider to be Canarium odoriferum hirsutum, *Rumph. amb.* 2. *t.* 51. The leaflets are downy, and more deeply serrate; and the stamina are inserted on the exterior margin of the nectary.

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208. GARUGA PINNATA.

Katou-kalesjam. *Rheed. mal.* 4. *p.* 69. *t.* 33.
Garuga, or Garoogoo of the Telingas.
Joom of the Bengalese.

GENERIC CHARACTER.

Calyx campanulate, five-toothed, inferior. *Petals* five, inserted on the calyx, alternate with five, and just above the other five

stamina. *Stigma* five-lobed. *Drupe* with two, or more, one-seeded nuts.

DESCRIPTION.

Trunk straight, and of great height, before the branches come out. *Bark* pretty smooth, and ash-coloured. *Branches* few for the size of the tree, forming a scanty head.

Leaves about the extremities of the branchlets, unequally-pinnate, from six to twelve inches long. *Leaflets* nearly sessile, from six to ten pair, opposite, obliquely lanceolate, crenate, or serrate, a little downy, the exterior pair largest; general length about two inches and a half, and about one broad.

Stipules ear-shaped, spreading, pointed.

Panicle, a small, single, nearly erect one, from the axills of the leaves that first appear.

Bractes minute, caducous.

Flowers yellow, inodorous.

Calyx beneath, one-leaved, campanulate, five-toothed.

Petals five, lanceolate, above the middle spreading, inserted on the calyx.

Nectary: five small, smooth, yellow glands, embossed on the inside of the calyx, between the insertions of the pairs of filaments.

Filaments ten, subulate, rather shorter than the corol, inserted into the calyx; the upper five alternate with the petals; the lower five just below them. *Anthers* oblong.

Germ oval. *Style* rather longer than the stamina. *Stigma* five-lobed, five-grooved.

Drupe round, fleshy, size of a nutmeg, smooth.

Nuts two, or more (five seem the natural number), irregular in shape, with irregular elevations and depressions on the outside, very hard, one-celled, one-seeded.

OBSERVATIONS.

A large tree, a native of various mountainous districts over India. The leaves drop about the close of the rains, and appear again with the flowers in February and March.

The wood of this tree being soft and spongy, is of very little use.

The fruit is eaten raw, but chiefly used for pickling; it has a rough, austere taste, which renders it unpalatable as it is taken from the tree, though very fit for pickling.

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209. HARDWICKIA BINATA.*

Acha, or Atti marum of the Tamuls.

GENERIC CHARACTER.

Calyx none. *Corol* 4-5-petalled. *Legume* one-seeded.

DESCRIPTION.

Branches numerous, spreading, with bifarious, alternate, slender, smooth, waving, drooping branchlets.

Leaves alternate, bifarious, petioled, binate, with a minute bristle between. *Leaflets* sessile, shape between semicordate and reniform, entire, very smooth on both sides, while young

* So named after Lieutenant Colonel Thomas Hardwicke, author of the Journey to Sirinagur, in the sixth volume of the Asiatic Researches, and of numerous unpublished descriptions in natural history.

tinged with red; slightly marked with three or four nerves; length from one to three inches, and a little more than half of that in breadth.

Petioles round, smooth, about one-fourth, or one-third the length of the leaves.

Stipules small, cordate, caducous.

Panicles terminal, and from the exterior axills, small, delicate, slender, and smooth in every part.

Flowers scattered, slender, pedicelled, small.

Bractes minute, caducous.

Calyx none.

Petals five, obovate, concave, spreading, somewhat hoary on the outside; inside yellowish; rather longer than the stamina.

Filaments ten, alternately shorter, inserted round the base of the germ. *Anthers* incumbent, ovate, with an acute point between the lobes.

Germ oblong. *Style* ascending. *Stigma* large, peltate.

Legume lanceolate, from two to three inches long, two-valved, striated lengthwise, opening at the apex.

Seed solitary in the apex of the legume, and there inserted, cuneate, furrowed: posterior edge thin, and somewhat membranaceous.

OBSERVATIONS.

This elegant tree is found indigenous on the mountains of the Coast of Coromandel, where it grows to a large size, and yields timber of an excellent quality for a variety of uses.

Some beautiful, thriving, young trees are in the Botanic Garden at Calcutta, reared from seeds sent from the mountains of Coromandel, by Dr. Berry of Madras.

210. HOPEA ODORATA.*

GENERIC CHARACTER.

Calyx beneath, five-leaved: two of them increasing with the capsule into wings. *Corol* one-petalled, contorted. *Filaments* ten, inserted on the tube of the corol, alternately two-cleft; *Anthers* fifteen. *Capsule* one-celled. *Seed* solitary.

DESCRIPTION.

Trunk erect, four feet in circumference, and high in proportion. *Branches* numerous, spreading in every direction, and adorned with many drooping, and expanding bifarious branchlets, covered with dark-brown smooth bark.

Leaves alternate, short-petioled, bifarious, drooping, ovate, oblong, entire, waved, smooth, shining, deep green on both sides; on the under side there is often a pretty large, single gland in the axill of each of the larger veins.

Stipules none.

Panicles terminal, and from the exterior axills, drooping, composed of alternate, bifarious, secund, recurved, villous, ramifications, of numerous, small, pale yellow, delightfully fragrant flowers.

Bractes cordate, acute, villous, caducous.

Calyx beneath, five-leaved: *leaflets* unequal, ovate, villous, permanent: the two largest increasing into two large, oblong, obtuse membranaceous wings, by the time the capsule is full grown.

* Hopea tinctoria of Linnæus is now referred to the genus of Symplocos. Linn. spec. plant. edit. Willdenow, 3. p. 1436.

Corol one-petalled, contorted. *Tube* short, campanulate. *Border* of five, oblique, sublinear-oblong, spreading divisions, with their margins revolute, curled, and somewhat villous.

Filaments ten, about as long as the tube of the corol, and inserted by broad, conical, fleshy bases, into its bottom; they are alternately larger and bifid. *Anthers* fifteen, two-lobed, with a subulate point from the apex of each, or as in Asarum, they may be said to adhere to the filaments below their apices.

Germ above, ovate. *Style* straight, length of the stamina. *Stigma* simple.

Capsule ovate, pointed, one-celled, one-valved, of a tender texture, closely inveloping a single seed, of the same shape and size; outwardly covered with the permanent calyx; two of the leaflets of which are now enlarged into two, linear-oblong, obtuse, tough, membranaceous, nervous wings, many times longer than the seeds.

OBSERVATIONS.

A single tree, and the only one I have seen, grows in the garden of Mr. Dowdeswell near Calcutta, originally from Chittagong, where it is indigenous. Flowering time the month of March, when the air, to a considerable distance, is perfumed with the fragrance of its blossoms. Seed ripe in May.

This tree is nearly allied to *Shorea*, as well as to *Dipterocarpus*. It differs from the first in having only two of the five leaflets of the calyx increasing into wings, and from both, in having a monopetalous corol, and only ten filaments, bearing fifteen anthers.

211. CARALLIA LUCIDA.

Carallie of the Telingas.

GENERIC CHARACTER.

Calyx six or seven-cleft, superior. *Petals* six or seven. *Stigma* three-lobed. *Berry* one-celled, one seeded.

DESCRIPTION.

Leaves opposite, short-petioled, oval, pointed, serrulate, smooth, shining on both sides, from four to five inches long, and two or two and a half broad.

Stipules intrafoliaceous, acute.

Umbellets axillary, small, rigid, few-flowered, generally three-cleft.

Calyx above, six or seven-parted, permanent; divisions acute.

Petals six or seven, orbicular, scalloped, waved, inserted into the divisions of the calyx by short claws.

Filaments twelve or fourteen, length of the corol, inserted into the calyx. *Anthers* oblong, erect.

Germ beneath, globular. *Style* length of the filaments. *Stigma* three-lobed.

Berry globular, smooth, pulpy, size of a large pea, one-celled, crowned with the very entire calyx.

Seed one, rarely two, reniform.

OBSERVATIONS.

A small handsome ever-green tree, a native of the lower region of the Circar mountains. Flowering time March and April.

212. SHOREA ROBUSTA.*

Gærtn. sem. 3. p. 48. tab. 186.

Salu the Sanscrit name, and Saul of the Hindoos and Bengalese.

GENERIC CHARACTER.

Calyx 5-leaved, imbricate, permanent, and enlarging into five long wings, round the capsule. *Corol* 5- petalled. *Capsule* above, one-cell'd, one-valved, one-seeded.

DESCRIPTION.

Trunk. sraight, of great thickness and height in full grown trees; beams being sometimes brought down 24 inches square, and thirty, or more, feet in length.

Leaves alternate, short-petioled, cordate-oblong, entire, smooth, firm, pale-greenish colour, with many simple, parallel, nearly opposite veins; from 4 to 8 inches long.

Stipules caducous, dotted with minute glands.

Panicles terminal, and from the exterior axills, spreading, very ramous, downy.

Flowers numerous, pretty large, pale yellow.

Bractes small, caducous.

Calyx beneath, five-leaved: *leaflets* unequal, downy on the outside, permanent, and enlarging into five long wings, surrounding with their base the pericarp.

Petals five, obliquely ovate-lanceolate, 3 or 4 times longer than the calyx; margins towards the apex revolute; on the outside somewhat sericeous.

Filaments from 25 to 30, longer than the calyx, inserted round the base of the germ; lower half broad and membranaceous. *Anthers* two-lobed, gaping round the apex, with a minute bristle between the openings.

Germ conical. *Style* awl-shaped, permanent. *Stigma* small.

Capsule ovate, pointed, one-cell'd, of a tender consistence, covered with soft, grey down, and enveloped by the enlarged leaflets of the calyx, each of them being now furnished with a long, wedge-shaped, reticulated, membranaceous wing.

Seed solitary (rarely two), of the shape, and size of the capsule.

OBSERVATIONS.

This majestic tree is a native of the skirts of the northern mountains of India; Calcutta is supplied with the timber thereof, chiefly from Morung; flowering time the hot season, seed ripe in three months thereafter.

The wood of this tree is in very general use near Bengal, for beams, rafters, and various other economical uses; it is of an uniform light brown colour, close grained, and heavy; at the same time it does not appear to be very durable, and on that account greatly inferior to Teak; for in strength it certainly surpasses it considerably, and appears to me to deserve the second place amongst our India timber trees, Teak being the first. This as well as some other species of the same genus, yields large quantities of the resin, commonly called Dammer in India, and very generally used, as a substitute for pitch in the Marine yard. The best pieces are also frequently used, instead of the common incense, (Benzoin,) in the temples of the Hindoos.

In the plate, the dissected flower is magnified; the fruit of its natural size.

* So named in honour of the Right Honourable Lord Teignmouth, late Governor General of Bengal, &c.

213. DIPTEROCARPUS TURBINATUS.

Gærtn. sem. 3. p. 51. tab. 188.

Tiliah-gurjeon of the Hindoos, in Tipperah and Chittagong.

GENERIC CHARACTER.

Calyx beneath, one-leaved, permanent; two of the five divisions of its border growing, with the pericarp, into two very large membranaceous wings. *Corol* five-petalled. *Capsule* ovate, one-cell'd, one-seeded.

DESCRIPTION.

Trunk straight throughout to the very top of the tree, and growing to an immense size; even so large as to be made into canoes that will carry one hundred men. *Bark* pretty smooth.

Branches ascending: *branchlets* alternate, bifarious, round, smooth.

Leaves alternate, short-petiol'd, bifarious, ovate-oblong, some entire, some waved, and even some are serrate; both sides smooth, deep shining green; veins many, straight, simple, and parallel; from four to twelve inches long.

Stipules within the leaves, large, sword-shaped, downy, caducous.

Spikes subaxillary, solitary, shorter than the leaves, smooth.

Flowers solitary, remote, alternate, large.

Calyx beneath, one-leaved. *Tube* rather gibbous. *Border* five-parted, irregular; two of the divisions being very much larger than the other three; these two continually increasing, until the seed is ripe.

Petals five, narrow, obliquely wedge-shaped, smooth on both sides and entire, except that sometimes they are emarginate.

Filaments about thirty, short, inserted round the base of the germ. *Anthers* ensiform, ending in long, tapering, acute points.

Germ above, ovate. *Style* erect, length of the stamina. *Stigma* perforated.

Capsule ovate, pointed, one-celled, one-valved, of a tender consistence, covered with short, soft, hairy down, and enveloped in the enlarged Calyx; the two larger divisions of its border are now, two very large, linear oblong wings, beautifully reticulated with veins and nerves.

Seed solitary, shape of the capsule; from its apex the embryo of the future plant issues.

OBSERVATIONS.

This immense tree is a native of Chittagong, Tipperah, Pegu, and other countries to the eastward of Bengal. Flowering time the beginning of the hot season; seed ripe in June aud July.

This tree is famous over the eastern parts of India, and the Malay Islands, on account of its yielding a thin, liquid balsam, commonly called *Wood-oil;* which is much used for painting ships and houses in India.

To procure the balsam, a large notch is cut into the trunk of the tree, near the earth; say about thirty inches from the ground, where a fire is kept up until the wound is charr'd, soon after which the liquid begins to ooze out. A small gutter is cut in the wood, to conduct the fluid into a vessel placed to receive it.

The average produce of the best trees, during the season, is said to be sometimes as high as forty gallons. It is found necessary every three or four weeks, to cut off the old charr'd surface, and burn it afresh; and in large, healthy trees, abounding in balsam, they even cut a second notch, in some other part of the tree, and

proceed as with the first. These operations are performed during the months of November, December, January, and February; should any of the trees appear sickly the following season, one or more years respite is given them.

214. BIGNONIA SUBEROSA.

Arboreous. *Bark* deeply cracked, and spongy. *Leaves* superdecompound: *leaflets* subcordate, entire, polish'd, with taper, obtuse points. *Panicles* terminal. *Tube of the corol* long and slender. *Anthers* calcarate. *Silique* linear, thin, smooth.

Millingtonia hortensis. *Linn. suppl.* 291.

Trunk straight. *Bark* light ash-colour, deeply cracked in various directions, and of a soft spongy nature.

Leaves opposite, superdecompound, about two feet long.

Leaflets subcordate, with long, taper, obtuse points, margins entire; of a deep dark green-colour, and smooth on both sides; from one to three inches long.

Petioles and *petiolets*, a little channel'd.

Panicles terminal, solitary, cross-armed, large, broad-ovate. *Ramifications* horizontal, the first trichotomous, then dichotomous, with generally a single flower in the fork.

Bractes minute.

Flowers numerous, large, pure white, and, like many of the other species of this charming genus, delightfully fragrant.

Calyx very small, slightly five-parted: divisions nearly equal and revolute.

Corol infundibuliform. *Tube* from two to three inches long, slender, and cylindric. *Border* four-parted, the upper division broader, and nearly half two-cleft.

Filaments only four. *Anthers* calcarate.

Germ oblong. *Style* as long as the corol. *Stigma* bilobate.

Silique slender, linear, thin, pointed, pretty smooth, two-celled, about 12 inches long, three quarters of an inch broad, and one line thick.

Seeds numerous, round, very thin, and surrounded with a remarkably fine transparent wing.

The native country of this beautiful tree I have not been able to discover; all I can learn is, that some plants, or seeds, were brought from the Rajah of Tanjour's garden, to Madras; from thence one plant was procured for the Company's Botanic garden at Calcutta, about twelve years ago. It is now an elegant tree, of about 30 feet in height; is in blossom about the close of the rains; the seeds ripen in March.

KYDIA.*

GENERIC CHARACTER.

Calyx double: exterior four-six-leaved. *Corol* spreading. *Anthers* fascicled. *Stigmas* three. *Capsule* three-celled, three-valved. *Seed* solitary.

* In memory of the late Colonel Robert Kyd, whose love for the science induced him, at the desire of the Honourable the English East India Company, to begin the Botanical Garden, and Public Nursery at Calcutta, in Bengal; which he conducted with much success during his life.

215. KYDIA CALYCINA.

Exterior calyx four-leaved, longer than the corol

Pandiky of the Telingas.
Choupulta of the Hindoos.

DESCRIPTION.

Trunk tolerably straight. *Bark* ash-coloured. *Branches* many, forming a large, dense head. *Bark* of the young shoots covered with a brown meally dust.

Leaves alternate, petioled, broad-cordate, more or less three, or five-angled, irregularly dentate, three, or five-nerved, both sides downy with stellate hairs, and a meally dust; size from three to six inches each way; on the principal nerve, and sometimes on each of the two next to it, an oblong, hollow, yellow gland.

Petioles round, two or three inches long, meally.

Panicles terminal, large, ramous, many-flowered.

Flowers numerous, pure white, collected in small umbellets: many of them are perfectly male.

Bractes small, rust-coloured.

Calyx double. *Exterior* four-leaved: leaflets oblong, spreading, obtuse, downy, three times longer than the inner, permanent. *Interior* one-leaved, campanulate, five-cleft, outside meally; inside clothed with short, white hairs.

Petals five, obliquely obcordate, much longer than the inner calyx, but shorter than the exterior, woolly at the base.

Filaments five, very short, thick, coalesced into a tube. *Anthers* twenty; four sessile on the apex of each of the five short filaments.

Germ above, conical. *Style* three-cleft: divisions recurved. *Stigmas* large.

Capsule small, somewhat three-lobed, hid in the inner calyx, three-celled, three-valved, opening from the apex.

Seeds, one in each cell, obtusely three-sided, brown, affixed to the bottom of the cell.

OBSERVATIONS.

A native of the coast of Coromandel, as well as of Hindoostan; where it delights in such soil as is generally found on the banks of rivulets. Flowering time the cool season.

216. KYDIA FRATERNA.

Exterior calyx six-leaved, shorter than the corol.

Pootrie of the Telingas.

DESCRIPTION.

Trunk straight. *Bark* rust-coloured.

Leaves in every respect like those of Kydia calycina.

Panicles terminal as in the former, but not so ramous.

Flowers and *Bractes*, also the same, but the *pedicells* are shorter, and thicker than in K. calycina.

Calyx double. *Exterior* five, or six-leaved, (or cleft to very near the base): *leaflets* oval, length of the inner calyx. *Inner* one-leaved, campanulate.

Corol as in Kydia calycina.

Filaments as long as their tube, and recurvate. *Anthers* twenty; four on the apex of each filament.

Germ ovate. *Style* as long as the staminiferous tube. *Stigma* three-lobed, even with the mouth of the tube.

OBSERVATIONS.

A native of the Circar mountains, where it grows to be a larger tree than the first species. Flowering time the rainy season.

The ripe seed-vessel was not seen, but the structure and contents of the germ indicate one similar to that of the first species.

CAREYA.*

GENERIC CHARACTER.

Calyx simple, 4-tooth'd, superior. *Petals* four. *Berry* with many seeds, scattered through its pulp.

217. CAREYA HERBACEA.

Herbaceous. *Flowers* peduncled. *Exterior filaments* longer, and sterile.

Bhoomi Darimba, its Sanscrit name.
Bhooi dalim of the Bengalese.

DESCRIPTION.

Root perennial, ligneous.

Stems scarce any, but several herbaceous shoots rise annually from the root; they are short, round, and smooth.

Leaves alternate, short-petioled, obovate-cuneate, serrulate, smooth on both sides; length from 4 to 8 inches.

Racemes lateral, short, supporting a few, large, remote, beautiful flowers.

Bractes lanceolate, two of which always embrace the calyx laterally.

Calyx above, four-parted: divisions oval, permanent.

Petals four, expanding, oblong, concave, longer than the fertile stamina, and inserted on or into their united fleshy base.

Filaments numerous; the exterior longer, and sterile; all are firmly united at the base, and with the corol drop off in one body, leaving the rim of insertion, which surrounds the bottom of the calyx on the inside, particularly conspicuous, on account of its large, elevated, crenulate, inner margin.

Germ oval, smooth, having four distinct cells. *Style* nearly as long as the stamina. *Stigma* enlarged, and obscurely 4-lobed.

Berry globular, size of a medlar, and of the same texture, and colour; and like it, crowned with the permanent calyx and part of the style: in the ripe fruit there are no distinct partitions to be found.

Seeds numerous, uniform, nestling in a considerable quantity of greenish, fleshy pulp; and often vegetating in the berry, while it appears fresh on the outside.

OBSERVATIONS.

A native of the Rungpore district, in the province of Bengal, where Mr. W. Carey discovered it, and sent plants to the Botanic Garden at Calcutta, where they blossom in February, and ripen their seeds in four months thereafter.

* Named after its discoverer, Mr. William Carey, a good botanist, and promoter of natural history in general.

218. CAREYA ARBOREA.

Arboreous. *Flowers* sessile. *Inner filaments* shorter and sterile.

Pelou. *Rheed. mal.* 3. *p.* 31. *tab.* 36.
Cumbie of the Telingas,
Pootta-tanni-marum of the Tamuls.

DESCRIPTION.

Trunk erect. *Bark* scabrous: outwardly of a dark rust-colour; inwardly a deep red, and fibrous. *Branches* numerous, and spreading; their bark smoother than that of the trunk.

Leaves about the extremities of the branchlets, short-petioled, obovate, running down on the short petioles to the base, slightly serrate, smooth, from six to twelve inches long, and from three to six broad.

Spikes terminal, short, thick, few-flowered.

Flowers large, of a pale greenish yellow colour.

Bractes threefold, embracing the base of the germ.

Calyx above, one-leaved, cup-shaped, four-toothed, partly permanent.

Petals four, oblong, many times longer than the calyx, and inserted on its inside.

Filaments numerous, as long as the petals: the interior are shorter and sterile; they are all united at the base, and inserted into the bottom of the calyx. *Anthers* oval.

Germ beneath. *Style* length of the filaments; more or less of it is permanent.

Berry very large, globular, smooth, fleshy.

Seeds numerous, somewhat compressed, oblong, or oval, scattered through the pulp of the fruit.

OBSERVATIONS.

A large tree; a native of the valleys amongst the mountains of the Northern Circars, as well as of various other mountainous parts of India. Leaves deciduous about the beginning of the cool season, November; and come out again with the flowers in March.

The wood of this tree is nearly of the colour of mahogany, but not so hard, nor so close in the grain. The natives make large mortars of it to bruise various kinds of oil-seeds in.

The bark is composed of long, tough fibres, of which strong, durable ropes are made. Match-lock-men also employ it, as well as that of Bauhinia parviflora, to make their matches of.

219. ERYTHRINA ARBORESCENS.

Subarboreous. *Trunk* and larger branches prickly. *Leaves* ternate, unarmed: *leaflets* reniform-deltoid, entire. *Racemes* straight. *Bractes* three-flower'd. *Calyx* truncate, entire. *Legume* pedicelled, fine-pointed, villous, 6-8-seeded.

Trunk of the young trees, when first in blossom, (18 months old,) straight, with not more than two, or three, simple, ascending branches, armed with a few, scattered, small, sharp prickles; otherwise smooth in every part.

Leaves ternate. *Leaflets* entire, smooth above, whitish underneath; the exterior one nearly reniform; the pair obliquely-broad-cordate.

Petioles longer than the leaflets, round, smooth, perfectly destitute of prickles. A pair of *Glands* at the insertion of the pair of leaflets, and another pair at the apex of the long portion which supports the terminal one.

Stipules oval, small.

Racemes from the exterior axils, solitary, perfectly straight, longer than the leaves.

Bractes solitary, three-flowered, ovate; within this common bracte, there is a minute proper one, at the base of each pedicel.

Flowers very numerous, large, the most vivid scarlet that can be conceived, three-fold, pedicelled, drooping over each other in an elegant, imbricated form.

Calyx entire, subcampanulate, smooth, coloured.

Corol: Banner subovate, boat-shaped, incumbent over the rest of the flowers. *Wings* shorter than the keel, obliquely-obovate, greenish. *Keel* also greenish, two-parted at the base and apex, scarce half the length of the stamens.

Filaments rather shorter than the banner, united into one body near the base, alternately longer.

Germ long, pedicelled. *Style* length of the stamens. *Stigma* acute, ascending.

Legumes pendulous, pedicelled, villous, cuspidate, torose at the seed.

Seeds from five to ten.

Dr. Buchanan sent from Napaul, the seeds to the Botanic Garden at Calcutta, where, in one and a half year, the plants blossomed for the first time, in October. In Napaul, Dr. Buchanan observed it to be a small, branchy tree, ten or twelve feet high; here in three years they were only five or six feet high, and with but very few branches.

220. ERYTHRINA RESUPINATA.

Herbaceous. *Leaves* ternate, appearing after the flowers decay. *Raceme* radical, leafless. *Corol* resupinate. *Filaments* one and nine.

Root perennial.

Stem nothing more than a single, four or five inch high, scarce prickly, slightly villous shoot, which (with the leaves) decays about the close of the rains.

Leaves ternate, rather long-petioled: leaflets nearly round, entire, smooth, two or three inches each way.

Petioles and nerves of the leaflets somewhat prickly.

Stipules ovate.

Racemes radical, short peduncled, appearing long before the herbaceous stem, roundish-ovate, under six inches in height, but uncommonly interesting, and beautiful.

Flowers numerous, three-fold, pretty large, bright scarlet.

Calyx bilabiate.

Corol resupinate. *Banner* oval-shaped, greatly longer, and larger than the keel, bright scarlet. *Wings* obovate, minute, and nearly colourless. *Keel* greatly larger than the wings, tinged with red.

Filaments one, and nine-fold, alternately longer; all are shorter than the banner, but double the length of the keel.

A native of Hindoostan. In the Botanic Garden at Calcutta they blossom in March, at which time no part of the plant is visible but the raceme.

221. CYLISTA TOMENTOSA.

Shrubby; the terminal shoots twining. *Leaves* ternate. *Racemes* axillary. Divisions of the *calyx* cuneate. *Legume* of one or two round lobes, with one, round, blue-violet, highly-polished seed in each.

Stem perennial, short, with but few stunted branches in its native sterile soil; but in the Botanic Garden at Calcutta, the second year the branches lengthened much, and twined to a considerable extent; the young parts are round and downy.

Leaves ternate. *Leaflets* cordate, entire, downy, from two to three inches long, and from one to two broad.

Petioles channeled, downy.

Stipules of the petiole lanceolate; of the leaflets subulate.

Racemes axillary, shorter than the leaves.

Flowers yellow.

Calyx to the base four-cleft, downy, permanent; divisions cuneate; the upper one broad and two-parted.

Corol papilionaceous, shorter than the calyx, withering.

Legume of one, or two, nearly spherical, villous lobes; when of two, it is about as long as the calyx.

Seed single, round, highly polished, deep-violet blue, of the size of a pea, in each lobe of the legume.

Is a native of the Mysore country, where it was discovered by Dr. Buchanan, and the seeds sent by him to the Botanic Garden at Calcutta, where the plants thrive well, and blossom about the close of the rains, and during the cold season; seed ripe in March and April.

In the parched soil of Mysore, Dr. Buchanan observed the plant to be stunted, and shrubby. In the rich soil of the Botanic Garden at Calcutta, the whole plant is twining after the first year, and very extensive.

222. FLACOURTIA INERMIS.

Arboreous, unarmed. *Leaves* elliptic, crenate-serrate, polished. *Racemes* axillary, short. *Flowers* hermaphrodite. *Style* 5-cleft.

Tomi-tomi of the Malays.

Trunk short, soon dividing into numerous branches, which form a large, very dense head of great beauty. *Bark* smooth, brownish, perfectly destitute of every thing like thorns, or prickles.

Leaves alternate, short-petioled, elliptic, smooth, shining green on both sides; when they first expand reddish, and then the tree is uncommonly gaudy; length from three to six inches.

Petioles semicylindric.

Stipules none.

Racemes axillary, longer than the petioles, few-flowered. *Pedicels* clavate, jointed near the middle.

Bractes ovate, caducous.

Calyx deeply 4-or 5-parted: divisions reniform, shorter than the stamens and pistil.

Corol none.

Filaments about twenty, inserted on a fleshy, nectariferous ring, which surrounds the base of the germ. *Anthers* two-lobed.

Germ ovate. *Style* 5-cleft, spreading.

A native of the Moluccas, where the tree is cultivated for its pleasant edible fruit. It has lately been introduced into the Botanic Garden at Calcutta, where it thrives well, and blossoms during the dry season.

223. MUSA SUPERBA.

Stem conical. *Leaves* petioled, but not sheathing. *Spadix* nodding. *Spathes* cordate, many-flowered, those of the female-hermaphrodite flowers permanent.

Trunk almost conical, being only three feet to the leaves; seven and a half in circumference, close to the ground; and four and a half immediately under the leaves; and invested with the numerous, somewhat stem-clasping bases of those that are decayed; height of the whole plant, to the highest part of the curvature of the spadix, 13 feet.

Leaves numerous, equally surrounding every part of the leafy stem, petioled, lanceolate, very entire, until broken by wind, filiform-pointed, smooth on both sides, with numerous parallel, diverging veins; length from five to ten feet, and from two to three broad.

Petioles short (about two feet long); the lower broad, embrace the stem at the base; while those near the spadix have long, stem-clasping sheaths, semicylindric on the under side, deeply channeled on the upper.

Spadix terminal, simple, drooping; before any of the spathes expand cordate.

Spathes numerous, expanding in succession, broad-cordate, slightly ribbed, smooth, ferruginous, many-flowered, permanent, and do not become revolute.

Flowers very numerous, 20-30, on a double series, to each spathe; the female-hermaphrodite occupy the base, or lower spathes; and the male-hermaphrodite the exterior.

Petals two, very unequal. *Exterior* involving the inner like a spathe, leathery, three-parted, though the linear divisions often adhere by their margins, and soon after expansion become twisted in one body. Inner petal five or six times shorter than the exterior, pale coloured, almost pellucid, and composed of two subrotund lobes, with an ensiform process between them; from the inside of the insertion of this petal, a very large quantity of transparent jelly is discharged.

Nectary: two filiform scales, inserted over the two fissures of the exterior petal.

So far the male-and female-hermaphrodite flowers agree.

Filaments five, with the rudiment of a sixth on the under side. *Anthers,* in the male hermaphrodite longer and thicker than the filaments; in the female hermaphrodite wanting, or only small, black, withered points.

Germ beneath; in the female-hermaphrodite large, and fertile; in the male, small and barren. *Style* linear, thick, and fleshy; in the female-hermaphrodite twice as long as the barren stamens; in the male-hermaphrodite only half the length of the fertile stamens. *Stigma* in both somewhat three-grooved, and obscurely six-lobed, clammy.

Berry oblong, size of a goose's egg, smooth, 3-celled.

Seeds numerous, angular, and black.

A native of the vallies, of the southern part of the Peninsula of India; from thence Dr. Anderson of Madras received it into his garden, where it blossomed and ripened its seed; part of which he sent to the Botanic Garden at Calcutta, where they were sown in June 1800, and in March and April 1803, one of the plants blossomed.

The fruit of this elegant stately species is of no use; when ripe it is more like a dry capsule, than a berry. The thick petioles, or ribs of the leaves, contain a considerable quantity of strong white fibres, which might be employed for various purposes.

224. TERMINALIA PROCERA.

Branches horizontal, verticillate. *Leaves* cuneate, polished. *Racemes* axillary. *Corol* rotate. *Drupe* oblong, obscurely five-sided: *Nut* of the same shape.

Leaves crowded about the ends of the branchlets, short-petiol'd, cuneate; margins slightly waved; apex rounded, with a large rather obtuse point; perfectly smooth on both sides; veins parallel, and simple, with a small hairy pit in the axil of each, and two glands on the sides of the nerve near the base; from 8 to 12 inches long, and from 4 to 5 broad.

Racemes axillary, solitary, shorter than the leaves.

Flowers numerous, small, pure white. *Hermaphrodite* near the base of the raceme; *Male* farther on.

Corol salver-shaped, spreading flat without any tube.

Stamens alternately short, and incurved.

Drupe oblong, obscurely five-sided, but not in the least compressed as in Terminalia Catappa, which in most respects this species resembles very exactly; when ripe, yellow. *Pulp* in large quantity, of a lively red colour, and pleasant subacid taste.

Nut in shape exactly like the drupe, but the five sides are better defined than in the entire fruit.

This very charming species is a native of the Andaman Islands, where it grows to be a tree of the first magnitude. From thence it was introduced, with many other valuable plants, into the Botanic Garden at Calcutta, by Col. Kyd in 1794, and now, 1802, the tree is about 30 feet high, with a slender, perfectly straight, smooth trunk; and several verticils, of horizontal branches, with bifarious, alternate branchlets. Flowering time, in Bengal, the month of March; fruit ripe in July. Its leaves, as in Terminalia Catappa, drop about the beginning of winter, in Bengal, and appear with the flowers in March.

225. MIMOSA SUNDRA.

Arboreous. *Bark* dark brown. *Prickles* stipulary, recurved, with decurrent base. *Leaves* bipinnate: pinnæ and leaflets about twenty pair each. *Spikes* axillary, one, or in pairs, cylindrical. *Stamens* monadelphous. *Legumes* lanceolate, thin, two, or three-seeded.

Sundra of the Telingas.

Trunk straight, *Bark* dark rust-colour, cracked and scabrous. *Branches* erect, twiggy.

Thorns stipulary, short, recurvate, remarkably strong and sharp; their base large, and considerably extended down upon the bark.

Leaves bipinnate, four or five inches long. *Pinnæ* as far as twenty-four pair, about an inch long. *Leaflets* about twenty pair, minute, and often swelled into various forms by the perforations of insects: an umbilicate, oblong *gland* just below the lower pair of pinnæ, and another between the exterior pair.

Spikes axillary, generally single, or paired, cylindrical, short-peduncled, shorter than the leaves, yellow.

Filaments numerous, united at the base into a tube.

Legume lanceolate, membranaceous, smooth.

Seeds two or three.

A small straight tree, a native of the forests and mountains of Coromandel.

The wood of this small tree is remarkably hard and heavy; of a very deep chocolate colour; the natives make pestles of it, to beat off the husk of paddy in large wooden mortars.

226. AMOMUM CARDAMOMUM.

Scapes radical, on the side of the stem, compound, flexuose, procumbent.

Amomum cardamomum. *Linn. spec. plant.* 1. *p.* 1.
Amomum racemosum. *Lamarck. encyclop.* 1. *p.* 134.
Amomum repens. *Linn. spec. edit. Willd.* 1. *p.* 9.
Elettari. *Rheed. mal.* 11. *p.* 9. *tab.* 4, *and* 5.
Cardamomum minus. *Pharmacop. Lond. and Edinb.*
Ailum-chedy, of the Tamuls (of the Malabar coast).
Ela, one of its many Sancrit names.

Ellatchi, of the Bengalese.
E-la-ey-chee, of the Hindoos.
Ebil, of the Arabians.
Kakeleh, of the Persians.

Root tuberous, with numerous fleshy fibres.

Stems perennial, erect, smooth, jointed, enveloped in the spongy sheaths of the leaves; from six to nine feet high.

Leaves bifarious, subsessile on their sheaths, lanceolate, fine-pointed, somewhat villous above, and sericeous underneath, entire; length from one to two feet.

Sheaths slightly villous, with a rounded stipulary process rising above the mouth.

Scapes several (three or four) from the base of the stems, resting on the ground, flexuose, jointed, ramous, from one to two feet long.

Branches, or *Racemes* alternate, one from each joint of the scape, suberect, two or three inches long.

Bractes solitary, oblong, smooth, membranaceous, nerved, sheathing; one to each joint of the scape, which embraces the insertion of the raceme, or branch, issuing therefrom, and one at each of their joints.

Flowers alternate, short-pediceled, solitary at each joint of the racemes, opening in succession as the racemes lengthen.

Calyx above, widening to the three-toothed mouth, about three-quarters of an inch long, striated with fine nerves, permanent.

Corol withering. *Tube* slender, as long as the calyx. *Border* double. *Exterior* of three oblong, concave, nearly equal, pale greenish-white divisions. *Inner* obovate, greatly longer than the divisions of the exterior border; margins some-what curled, with apex slightly three-lobed; marked, chiefly in the centre, with purpled-coloured stripes; at each side of the insertion, close by the base of the filament, a small acute hornlet, as in several of our Indian amomums.

Filaments short, erect. *Anther* two-lobed, emarginate.

Germ beneath, oval, smooth. *Style* slender. *Stigma* funnel-shaped.

Nectarial scales subulate, almost half the length of the tube of the corol.

Capsule oval, somewhat three-sided, size of a small nutmeg; three-celled, three-valved. *Seeds* many, angular.

A native of the mountainous parts of the coast of *Malabar*. Flowering-time the rainy season; seed (the real cardamom) ripe, and gathered in November.

The following satisfactory account of this interesting plant, has lately been transmitted to me, by Captain Dickenson, the commanding officer of the district of Wynaad, where the Cardamom is cultivated. viz.

" The Cardamom shrub, which is found in great abundance " among the western mountains of Wynaad, is called by the Ma- " labars, Ailum-chedy, (the Ailum shrub); I cannot obtain any " satisfactory derivation of the true import of the word Ailum, " unless, as is alledged, it implies in the Sanscrit language, cele- " brity and eminence.

" The shrub is said to be produced as follows:—Before the " commencement of the periodical rains in June, the cultivators " of the Cardamom ascend the coldest, and most shady sides of a

" woody mountain. A tree of uncommon size and weight is " then sought after; the adjacent spot is cleared of weeds, and " the tree felled close at its root. The earth, shaken and loosened " by the force of the fallen tree, shoots forth young cardamoms in " about a month's time. I have repeatedly enquired of the " natives, the means by which the cardamoms are first produced, " and have invariably been told as already stated. They attribute " no other effects to the tree, (which may be selected from any " species,) than such as are derived from its weight and strength, " added to the shade and shelter which its branches afford to the " young sprouts. I have heard it by some asserted, that the " Cardamom, like the fabled phœnix, would emerge from the " ashes of any large forest tree; but these stories were uttered " only by the ignorant, and are too absurd to require comment.

" The shrub continues to grow in this manner until after the " early rains of the fourth year in February, when it has reached " its utmost height, which varies from six to nine feet; four or " five tendrils are now seen to spring from its stem near the root, " and afterwards is produced the fruit, which is gathered the " following November, and requires no other preparation than " drying in the sun. The fruit is annually collected in this way " until the seventh year, when it is usual to cut it down, and from " the trunk other sprouts arise in the course of the next monsoon, " which grow, flourish, and are cultivated as before. The husk " with the seed I have called the fruit, as it corresponds with " the native name. The seeds are termed the rice, and the ten- " drils the threads of the plant.

" I do not hear of any varieties in the species. It may be " not unnecessary to mention, that this commodity yields to " government from 25 to 30,000 rupees per annum. The " inhabitants use it as a general condiment to their food; and " it is likewise held in sacred estimation for the purposes of " sacrifice. It is constantly chewed with beetle; and some medi- " cinal properties are ascribed to it when used in decoction for " complaints in the bowels. I am assured by all, that the seeds " of the Cardamom will never produce any thing, and it is only " to be propagated as already stated, or by cuttings."

227. AMOMUM CARDAMOMUM.

Leaves short petiol'd, lanceolar. *Spikes* even with the earth, lax. *Bractes* lanceolate, acute. *Lip*, with anterior margin 3-lobed, *Crest* 3-lobed.

Amomum cardamomum. *Linn. spec. edit. Willd.* 1. *p.* 8. *Roxb. in Asiat. resear.* 11. *p.* 343.
Amomum cardamomum. *Kœnig in Retz. obs.* 3. *p.* 59.
Cardamomum minus. *Rumph. amb.* 5. *t.* 65. *f.* 1.

DESCRIPTION.

Root perennial, creeping under the surface of the soil, like that of ginger, but smaller, less fleshy, more ligneous and white, from which descend, and spread many fleshy fibres.

Stems herbaceous, several, rising obliquely to the height of from two to four feet, and about as thick as a stout ratan, invested in the smooth deep green sheaths of the leaves.

Leaves alternate, bifarious, short petioled on their smooth, stem-clasping sheaths, from broad-lanceolate below, to narrow-lanceolate at top; entire and smooth on both sides, point long and very fine; length from six to twelve inches.

Spikes radical, sessile, oblong, appearing amongst the stems, half immersed in the earth, loosely imbricated, with one-flowered, ovate, acute, villous, nervous, scariose, ash-coloured bractes; when old their brittle tops are often broken off.

Bractes, besides the exterior, one-flowered ones, just mentioned; there is an inner, striated, downy, scariose, two-toothed, tubular one, which I have sometimes considered an exterior calyx; and which Kœnig sometimes calls an involucre, inserted round the base of the germ.

Flowers opening in succession, and not very conspicuous.

Perianth above, clavate, tubular, downy, three-toothed, length of the tube of the corol.

Corol: Tube slender, and slightly incurved. *Exterior* border of 3, subequal, pellucid divisions. *Inner* one rather longer than the exterior three, greatly broader, somewhat three-lobed, with crenate, curled margin: middle lobe yellow, with two rosy lines leading up on each side, from the mouth of the tube.

Filament scarce half so long as the border of the corol, incurved over the mouth of the tube. A slender subulate horn on each side of the base of the filament, and nearly its length.

Anther large, fleshy, with large, three-lobed, concave apex, over which appears the large, infundibuliform stigma, rising through the deep groove, between the two polliniferous lobes.

Germ beneath, downy, and crowned (within the base of the tube of the corol,) with the two *nectarial scales;* here they are short, broad, and truncated.

The seeds prove to the taste agreeably aromatic, and are used by the Malays as a substitute for the real *cardamom* of Malabar. The whole plant possesses an agreeable fragrant spicy smell.

OBSERVATIONS.

A native of Sumatra and Malay Islands to the eastward of the Bay of Bengal; and sent by Dr. Charles Campbell from Bencoolen to the Botanic Garden at Calcutta, where it blossoms in April.

GLOBBA.

GENERIC CHARACTER.

Corolla with interior border two-lobed, or none. *Filament* very long, curved; base tubular, and winged, with a cuneiform lip. *Anther* double (appendicled or naked). *Capsule*, one-celled, three-valved. *Seeds* many, attached to 3 parietal receptacles.

228. GLOBBA PENDULA.

Leaves lanceolate. *Racemes* terminal, compound, greatly longer than the leaves. *Anther* bicalcarate. *Roxb. in Asiat. resear. vol.* 11. p. 359.

DESCRIPTION.

Root fibrous, perennial.

Stems erect, about three feet from the ground to the highest part of the curvature of the panicle.

Leaves lanceolate, smooth, fine-pointed, about six inches long and one and a half broad. *Sheaths* a little hairy on the outside.

Panicle terminal, long and pendulous; composed of remote diverging branches; each bearing 2, 3, or 4, middle-sized, yellow, short pedicelled flowers on their extremities, which expand in succession.

Bractes of the branches solitary, linear-oblong; of the flowers oval: all have their margins ciliate.

Calyx short-campanulate, deeply three-toothed.

Corol one-petalled, irregular. *Tube* long, slender, and curved upward. *Border* double. The *exterior* is composed of five divisions, three outer and two inner; the posterior one of the first three is broad, lanceolate, acute, and concave; the anterior two obliquely-obovate; the other (inner) two are lanceolate. *Inner* border, in this species, considerably elevated on a continuation of the tube, (or it may be called the tubular base of the filament), forming a vertical lip, or apron to the long slanting mouth of the tube; the lower two rounded tubes of this peculiar, (and in all the species I have seen), constant appendage, are shorter than the portion of the tube which raises them above the exterior border; the upper very slender cloven ends thereof extend a considerable way up the forepart of the filament, and adhere to it on each side of the groove formed therein for the style.

Filament very long and slender, but in this species less curved than in the other; grooved on the fore part for the reception of the style. *Anther* two-lobed, from the lower end of each a long slender, sharp spur projects.

Germ inferior, oval. *Style* filiform. *Stigma* funnel-shaped, with ciliate margin.

Capsule: I have seen it only in its half grown state; it has then three cells, with parietal receptacles, and many seeds in each; but the partitions are so slender, as to induce me to think they disappear by the time the seeds are ripe, as in G. orixensis and radicalis.

OBSERVATIONS.

This very beautiful plant is a native of the forests of the Island of Pulo-pinang, where it blossoms during the rainy season.

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229. GLOBBA ORIXENSIS.

Leaves oblong. *Panicle* terminal. *Anther* naked. *Capsule* warty. *Roxb. in Asiat. resear.* 11. *p.* 358. *tab.* 8.

DESCRIPTION.

Root perennial.

Stems oblique, smooth, from two to three feet high, including the panicle.

Leaves bifarious, spreading, oblong, taper-pointed, smooth on both sides, finely veined, from 6 to 10 inches long, and from 2 to 4 broad. *Sheaths* little more than half stem-clasping, smooth.

Panicle terminal, nearly erect; composed of short, rigid, smooth, jointed, simple, expanding branches.

Flowers sessile, small, solitary from the joints of the branches of the panicle: colour a dark orange-yellow.

Bractes solitary, oval, small, one-flowered, caducous.

Calyx campanulate, three-toothed.

Corol: Tube a little curved, widening gradually from the base to the mouth. *Exterior border* of five divisions; the outer three nearly equal; the inner two smaller and ovate; all are of the same dark orange colour, and spreading. *Inner border* nearly as in the last described species, only less elevated above the exterior five lobes, and with the lower end retuse and scarlet, coloured in the centre.

Filament incurved like a fish-hook. *Anther* two-lobed, naked.

Style shorter than the tube of the corol and filament, consequently not lodged in the usual groove of the filament, but takes a shorter and less curved direction to reach the anther, where its apex passes between the lobes thereof. *Stigma* perforated.

Capsule nearly round, firm, fleshy, and warty, one-celled, containing many oblong seeds, but unfortunately neither the original drawing, nor description, take any notice of their insertion.

OBSERVATIONS.

A native of the moist valleys up amongst the mountains of the Rajahmundry Circar, where it blossoms during the rainy season.

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230. GLOBBA RADICALIS.

Panicle radical. *Anther* winged.

Globba radicalis. *Roxb. in Asiat. resear.* 11. *p.* 359.

Mantisia saltatoria. *Sims in Botan. magaz.* 1320.

DESCRIPTION.

Root perennial, composed of numerous, diverging, fleshy fibres, or slender tubers.

Stems leaf-bearing, but a little to one side, from one to two feet high.

Leaves alternate, bifarious, sessile on their sheaths, lanceolate, with long, withered, filiform points; villous on both sides; length from six to nine inches, and about one and a half broad. *Sheaths* smooth, keeled on the back: the ligule, or stipulary process rises a little on each side.

Scapes radical, 3 or 4 inches long, often several from the same cluster of roots, erect, enveloped in three or four alternate, smooth, short sheaths.

Panicle erect, about a foot high, including the scape, and expa nd nearly as much; the whole, except the yellow inner border of the corol, a very lively blueish-purple. *Ramifications* alternate, long, simple, horizontal, or slightly reclined, each bearing in succession numerous, alternate, sessile, rather small, lovely purple and yellow flowers.

Bractes solitary, light purple, smooth; of the ramifications oblong; of the flowers cordate: all are permanent.

Flowers solitary, sessile in the axils of their proper bractes.

Calyx above, clavate, smooth, light purple; mouth three-toothed: permanent, with the lower half of the tube of the corol.

Corol: Tube long and very slender, the lower half, which is inclosed in the tube of the calyx, projects horizontally; the upper half erect; at the angle (nearly a right one,) which those portions of the tube make the flower drops, leaving the lower half to wither. *Border* double. *Exterior* three parted; (in the other species it is five-parted,) posterior division erect, pressing on the back of the base of the filament, oblong, boat-shaped; anterior, or lower two divisions obliquely-cordate and reflexed, all the three are of a light

purple colour, *Inner* vertical, with both ends cloven, the lower deeply so, and greatly larger than the divisions of the exterior border; colour a deep orange-yellow, which forms a pretty contrast with the lively purple of every other part of the panicle.

Filament very long, and very slender; first day much incurved, after revolute; finely grooved on the underside for the reception of the style; near the base two very long, slender, subulate, diverging, recurved wings. In the other species known to me these are wanting. *Anther*, two-lobed, and enlarged at the sides with two, broad, reniform wings.

Germ beneath, oval, with six longitudinal ridges; a transverse section exhibits one cell only, with numerous seeds affixed to three parietal receptacles. *Style* very slender. *Stigma* funnel-shaped.

Capsule globular, purple, size of a small cherry, six-ridged, one celled, three-valved, opening spontaneously from the apex. *Receptacles:* a longitudinal ridge on the inside of each valve.

Seeds many, minute, oblong, villous; connected by a large white spongy membrane to the parietal receptacles.

OBSERVATIONS.

Found wild at *Chittagong*, by Mr. William Roxburgh, and by him introduced into the Botanic Garden at Calcutta in 1801, where it blossomed for the first time in May 1802, at which period the new foliage also begins to appear above ground. There is a constant succession of flowers, from the extremities of the lengthening branches of the panicle, for nearly two months.

by Mr. Duncan, at the desire of the Governor General in Council, for the Company's Botanic Garden at Calcutta, where it blossoms about the close of the rains in September.

For the economical uses of the tuberous roots of this plant, I beg leave to refer to Abbé Grosier, and other historians, who have had opportunities of observing in what manner they are employed by the Chinese; and to the following extract from Mr. Duncan's letter, which accompanied the plants.

"Maa-tai; Pu-tsai; or Pi-tsi of Abbé Grosier; the water "chesnut; grows in tanks: these are manured for its reception "about the end of March. Thus, a tank being drained of its "water, small pits are dug in its bottom, these are filled with "human manure, and exposed to the sun for a fortnight; their "contents are next intimately blended with the slimy bottom of "the tank, and the slips, or roots of the plant deposited therein; "the water is now returned to the tank, and the new crop of "tubers comes to perfection by the first of September.

"This nut is in high estimation among all ranks of Chinese, "not only as a pot-root, but also as a medicine. It is eat, either "boiled or raw. I will not vouch for the truth of the singular "virtues ascribed to the Maa-tai, but just relate one of the most "plausible. The children here often play with cash in their "mouths, which at times slip down into the stomach, and bring "on alarming symptoms: The nut is immediately given in quan-"tities, either raw or boiled, and they say it never fails to give "relief, and is always considered as specific; they allege it "decomposes the metal."

231. SCIRPUS TUBEROSUS.

Culms round, jointed, leafless. *Spike* terminal, cylindric; scales oblong. Base of the style cordate. *Seed* obcordate, beset with glochidate bristles.

Pi-tsi, Maa-tai, Pu-tsai, or Pe-tsi, or Water-chesnut of the Chinese.

DESCRIPTION.

Root fibrous, with stoloniferous shoots, and round turnip-shaped tubers.

Culms erect, naked, slightly twisted to the right, inwardly intercepted at every line, or line and a half, by a slender membrane; every eight, or tenth of these partitions, is of a firmer texture, and visible on the outside, even when the plant is growing.

Leaves none, except a slender short sheath or two at the base of each culm.

Spike terminal, solitary, cylindric.

Scales oblong, membranaceous-margined.

Stamens three.

Style two, or three-cleft, at the base swelled out into an ovate-cordate, compressed shape.

Seed obcordate, surrounded with glochidate bristles.

OBSERVATIONS.

It is mentioned by Abbé Grosier, under the name of Pi-toi, and under the other appellations, was transmitted from *Canton*,

232. SACCHARUM SINENSE.

Culms 6-15 feet. *Leaves* flat, with margins hisped. *Panicles* ovate, with simple and compound, verticelled, reclined branches. *Corol* of two valves on the same side.

DESCRIPTION OF THE PLANT WHEN IN BLOSSOM.

Stem erect, jointed, whole height from 10 to 15 feet; most part covered with the sheaths of the leaves; joints from four to eight inches long, and from two to three inches in circumference; colour pale brownish yellow.

Leaves sub-bifarious, tapering from the base, (ensiform) to a long fine point, plain, smooth on both sides, margins armed with numerous, small, very acute spines, pointing forward; length from two to three feet, and about an inch and a half broad at the base.

Sheaths smooth, with a small stipulary ring round the inside of the mouth.

Panicle ovate, erect; *branches* simple and compound, subverticelled, reclined, long and slender. In *S. officinarum* the branches of the panicle are scattered over the common raches, and are decompound, and super-decompound: on this I rest the most obvious specific difference, though the habit of the cane itself is also considerably different, independent of the additional small inner scale, or valve of the corol.

Calyx and its surrounding wool, as in the genus.

Corol of two valves on the same (anterior) side; the inner one very small.

Nectary of two large, broad cuneate, crenulate, fleshy scales, which occupy the two posterior sides of the germ, opposite to the two valves of the corol.

This new species, for such it appears to me, was introduced from China into the Botanic Garden at Calcutta, at the close of the year 1796; with the hopes of finding it in some respects better than the common cane cultivated over India, and hitherto it has promised considerable advantage; particularly as the cane is so solid and hard, as to resist the forceps of the white-ants and teeth of the jackal, two great enemies to our East Indian sugar plantations. At the same time it bears drought much better than the sorts in general cultivation. Lasts (ratoons,) so as to be a profitable crop even to the third year; (while the common cane of India must be renewed every year;) and yields juice of a richer quality.

It seems to be the sort employed over China for making their sugars from, as appears from the following extract of a letter from Mr. A. Duncan, the Surgeon to the Factory at Canton, to Richard Hall, Esq. President, &c. Select Committee, dated Canton, 26th October 1796, which accompanied this cane from China; explaining the mode of cultivation, and manufacturing the sugar in the Province of Canton.

"Of sugar-canes, two sorts are cultivated in the Province of "Canton; one which is small, compact, and highly saccharine, "is manufactured into sugar: whereas the other of a larger size, "and looser texture, is generally cut into joints and ate by the "natives, either raw or gently heated.

"The culture of sugar-canes commences about the middle of "March, or beginning of April, in proportion to the temperance "of the weather, when a good, light, sandy soil is thrown up "into beds of about four feet diameter, leaving intermediate "spaces of one and a half, which serves as drains, and passes "for the husbandmen. A compost of human manure and water "is now thrown over the beds; and tops of sugar-canes, fifteen "inches long (the Chinese are here œconomical) are planted in "a slanting position, and occasionally watered at sun-set, till the "young shoots rise a cubit high, when the husks and refuse of "the ground-nut, or of some oleaginous seeds, after the oil is "extracted, are well beaten into a kind of powder, and put round "the roots of the plants in small quantities, and afterwards "covered over with earth. The canes are now left to the fertility "of the soil, except it proves such a dry season, that watering "becomes requisite till they arrive at maturity, and are cut down "about the first of November. The first sort planted in the "foregoing manner, generally yields three crops, while the "second requires fresh planting.

"The sugar canes are now removed from the grounds to the "mill for expression. The juice being extracted, is carefully "strained, mixed with a small quantity of chunam lime water, "then poured into large warm iron pans, placed on a platform "of brickwork, with fire places below; it is now boiled for a "length of time, and being removed from the fire, and allowed to "cool, it is a second time strained, and being again returned to "the pans, the boiling is repeated for once or twice, till it ac- "quires a saccharine consistence. The sugar, still very moist, "is now put into cylindrical jars, which have a small hole in "each of their bottoms, for the intent of draining, and their tops "covered over with about half an inch of clayey moist earth;

"these are placed on stands, and remain for three or four days, "when the old earthen covering is removed, and a fresh one put "on; they continue in that situation for three or four days more; "the covering is then taken off, and the sugar being sufficiently "clarified, is removed from the jars, and spread out on flat bas- "kets, exposed to the sun till dry, when it is fit for use. The "mill for expressing the juice, (of which I have sent a very exact "miniature model) appears, so far as I recollect, preferable to "those used in India. The machine is wrought by a buffalo "yoked to the small end of the crooked beam, while its thick end "is fastened to the long axle of one of the cylinders; the canes "having undergone one expression, and consequently in a split "state, are not thrust a second time through, till all the irons are "greased. The cylinders are not always of the same dimensions, "those I examined were two cubits high, and one and two-thirds "in diameter, these are the common size; I am however told "they are sometimes much larger."

To point out the benefit that may accrue to the cultivators of sugar cane, it may be necessary to add the following copy of a letter from Mr. Richard Cardin, superintendant of the Honourable Company's rum and sugar works at Mirzapore, in Bengal, to Dr. Roxburgh, dated 13th August 1801, nearly five years after the introduction of the cane.

"With respect to the produce of the common Bengal sugar "canes, I have never been able to collect an account that can be "depended upon; the natives generally manufacture the juice "into jaggery in my neighbourhood, which yields them nearly "14 cutcha muds (maunds) of 60 sicca weight per biggah on an "average, and a profit of about 11 or 12 rupees per biggah. Nei- "ther the white ants or jackals have committed any depredations "on the China canes that I have planted, although the latter has "often been seen among them, which certainly gives these canes a "decided preference to the Bengal sugar-canes. I do not think "the China degenerate in the least, nor do they improve; they "appear to me to remain nearly in the same state. If planted at "the same time the natives put their canes in the ground, they "will not make such good returns as the Bengal sort; but planted "in the West India mode, in the month of October or September, "and suffered to remain on the ground till the December or "January twelve months, they will then yield double the returns "of what the Bengal canes do, which is owing, in part, to the "length of time they are in the ground, and principally to the "ants and jackals not destroying them; whereas, if the Bengal "cane was to remain so long on the ground, the natives would "have great difficulty to prevent the most of them from being "destroyed, and the young shoots suffer very much from the hot "winds and ants, which I witnessed the second year I came to "Mirzapore; but the China shoots from these canes I cut last "January, stood the last hot season uncommonly well, and will "next January, I have reason to believe, from the present appear- "ance, make half, or nearly three-fourths the quantity of sugar "they did last January, and that with the trifling expense of "cleaning them twice, cutting and manufacturing the juice. I "should be extremely happy to have sent you a more particular "account, which is not in my power, as the statement of the "natives is not to be depended upon. I did purchase 12 cottahs "of the best Bengal canes last January, merely as an experiment, "which yielded just half the quantity of sugar my China canes "did."

233. HYDROPHYLAX MARITIMA.

Linn. sp. pl. ed. Willden. 1. *p.* 581.

Sarissus anceps. *Gært. sem.* 1. *p.* 118. *t.* 25. *f.* 4.

DESCRIPTION.

Root perennial.

Stems no other than many long, slender, variously bent, straggling, round, coloured branches, running over the sand, and often striking root from the joints.

Leaves opposite, approximate, short-petioled, elliptic, fleshy, recurved, rather acute, smooth, deep green, with hisped margins.

Connecting membrane, with the petioles form a deep, stem-clasping, dentated cup.

Flowers axillary, subsessile, one or two together, of a pale pink colour.

Calyx above, four-parted; divisions broad-ensiform, permanent; tube hairy on the inside near the bottom.

Corol campanulate; tube hairy on the inside near the bottom; the four divisions of the border ovate, spreading, with their apices somewhat revolute.

Filaments four, erect, shorter than the corol, and inserted on the mouth of its tube, opposite to its fissures. *Anthers* purple.

Germ oblong. *Style* length of the corol. *Stigma* of two round lobes.

Pericarp, when ripe a dry *Berry*, of a lanceolate shape; crowned with the remaining calyx, two-celled, with a single, linear-oblong seed in each, &c. as described and figured by Gærtner, under the name Sarissus anceps.

OBSERVATIONS.

A native of the sand hills along the shores of *Coromandel* and *Malabar*, where it is in blossom most part of the year.

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234. TRAPA BISPINOSA.

Nuts with two opposite, straight, barbed, spinous horns. *Nectary* cup-shaped, curled.

Sringataca, *Asiatic resear. vol.* 2. *p.* 350.

Sringata, its Sanscrit name. See *Asiatic resear. vol.* 4. *p.* 253.

Singhara, of the Bengalese and Hindoos.

Panover-Tsjeraua. *Rheed. Mal. v.* 11. *p.* 65. *t.* 33, is evidently intended for this plant, and not for T. natans.

DESCRIPTION.

Root numerous, simple, capillary fibres, issue from the under margins of the cicatrizes of the fallen leaves.

Stems stoloniferous, often several feet long, floating, or when the water dries up, running along the mud.

Leaves petioled, alternate, approximate round the apex of the shoots; of a rhomboidal-reniform shape, with the posterior

margins entire, and the anterior serrate-dentate; above smooth, deep green; villous and purple underneath; from 3 to 4 inches broad, and scarce so long.

Petioles villous, lengthening with the age of the leaves; towards the apex much swollen: this part contains many inflated vesicles, which render the whole plant very buoyant.

Stipules two-pair; the superior simple, semilanceolate, and caducous; the inferior pair at first simple and filiform, by age become very ramous like roots, and are permanent, as in the figure.

Peduncles axillary, solitary, shorter than the petioles, one-flowered, incurved until the blossoms begin to decay, after that they bend down under the surface of the water, where the fruit grows and comes to maturity.

Flowers pure white, expand above the surface of the water late in the afternoon.

Calyx four-leaved, in opposite pairs; leaflets lanceolate, villous, one of the pair permanent.

Corol contorted; petals four, at the base contracted into a tube by the firmness of the calyx; above greatly broader, and expanding; margins much curled.

Nectary cup-shaped, on the top of the germ round the swelled base of the style, eight-grooved, with margin minutely lacerate, and curled.

Filaments four, incurved. *Anthers* oval, incumbent.

Germ beneath. *Style* length of the stamens. *Stigma* large, and nearly hemispheric.

Nut turbinate, armed with two opposite, very-sharp, barbed spines, formerly, the two larger leaflets of the calyx one-celled.

Seed solitary, large, conforming to the shape of the nut, which it completely fills. *Embryo* lodged in the top of the albumen, immediately under the remains of the style.

This is evidently a species perfectly distinct from the two already described, viz. *natans* and *bicornis*. From the former it differs in having only two horns, and from the latter in these horns being straight, very sharp, and barbed.

OBSERVATIONS.

Found floating on sweet standing water, over *Bengal*, and many other parts of *India*. Flowering time the rainy season.

The nuts are sold in most bazars when in season, so much do the Hindoos admire their kernels.

EXPLANATION OF THE FIGURES.

1. Part of a plant.
2. A small portion of the stem, with part of the petiole. (a) of a leaf, and part of peduncle (b) with the upper pair of stipulus (c c) and lower pair, (d d) one of them beginning to be fibrous.
3. A small portion of the stem, to show the roots (a) issuing from the margins of the pit of a fallen leaf, between the *now* ramous inferior pair of stipules (b b).

The above are all of the natural size.

4. Part of a flower magnified, to show the plaited nectary.
5. The nut, natural size.
6. Section of the same, with the embryo in the apex.

PORANA.

Gen. plant. edit. Schreb. n. 236.

GENERIC CHARACTER.

Calyx five-leaved, in the fruit larger. *Corol* one-petalled, campanulate. *Style* cloven. *Stigmas* globular. *Capsule* superior, entire, one-celled, one-valved, one-seeded.

235. PORANA PANICULATA.

Shrubby, scandent. *Leaves* exactly cordate, entire, hoary. *Panicles* terminal and axillary. Three of the leaflets of the *Calyx* increase with the capsule into large, scariose wings.

DESCRIPTION.

Stem woody, dividing into numerous, very long, (many fathoms,) scandent, stout, woody *branches;* which extend over the largest trees, ruins, or whatever else they meet with ; their extremities drooping beautifully. *Bark* of the woody-parts ash-coloured, of the young shoots clothed with whitish, soft down.

Leaves cordate, entire, fine-pointed, villous on both sides, but particularly so, and hoary, underneath ; from one to four inches each way.

Panicles terminal, and from the exterior axils, pendulous, or drooping.

Flowers very numerous, small, pure white.

Calyx five-leaved, downy ; leaflets unequal, but all greatly shorter than the corol.

Corol one-petalled, campanulate ; margin five-lobed.

Filaments five, inserted into the bottom of the tube of the corol. *Anthers* linear, half hid.

Style short, very little cloven in this species. *Stigmas* round.

Capsule superior, ovate, one-celled, one valved, brittle, villous, size of a small pea, surrounded by the remaining calyx ; three of the five leaflets thereof, are now scariose, and enlarged into as many oblong lanceolate wings, two or three times longer than the capsule itself; the other two continue of their original length, but contracted in breadth, in short filiform.

Seed solitary affixed, to the base of the capsule.

OBSERVATIONS.

A native of the interior parts of *Bengal;* and particularly plenty upon the ruins of Gour, and the Rajamahl hills. Flowering time the cold season, seed ripe in March.

A large plant, 30-40 feet long, covering a mango tree, is now in full blossom before me, and in this state it is certainly one of the most beautiful objects I have yet seen in India ; the long pendulous extremities of the branches, with their numerous panicles of small, pure white flowers, and hoary leaves, render it a very charming sight. *Porana volubilis Burm. fl. ind. p.* 51. *t.* 21. *f.* 1. which is also now in flower in the Botanic garden, is a smaller plant, of much slower growth; and though beautiful, is by no means so conspicuously so as P. paniculata. Dr. Buchanan has found a third annual species in *Nepaul.*

SPERMADICTYON.

PENTANDRIA MONOGYNIA.

GENERIC CHARACTER.

Capsule inferior, one-celled, five-valved. *Seeds* five, lattice-arilled. *Corol* funnel-shaped. *Stigma* five-cleft.

236. SPERMADICTYON SUAVEOLENS.

Shrubby. *Leaves* opposite, elliptic. *Flowers* in terminal umbelliform heads.

DESCRIPTION.

Stem erect, shrubby. *Branches* opposite, cross-armed, ascending. *Bark* of the ligneous parts ash-coloured, with dark purplish specks.

Leaves opposite, short-petioled, from elliptic to lanceolate, smooth, entire ; length from three to six inches.

Stipules, or rather connecting membranes, broad, ensiform.

Flowers sessile, in terminal corymbiform heads, on short trichotomous branchlets ; numerous, pure white, and delightfully fragrant.

Bractes ensiform, villous, several surrounding each fascicle, or head of flowers, as well as intermixed amongst them.

Calyx above, five-cleft, permanent ; divisions subulate.

Corol one petalled, funnel-shaped. Tube slender, widening a little towards the mouth. Border of five, spreading, oblong divisions.

Filaments five, very short, inserted into the tube of the corol a little within its mouth. *Anthers* half erect, linear.

Germ beneath, oval. *Style* as long as the tube of the corol. *Stigma* five-cleft.

Capsule oblong, hairy, one-celled, five-valved, opening from the apex.

Seeds five, one for each valve of the capsule, black, compressed, enveloped in a dry, latticed aril.

OBSERVATIONS.

This charming fragrant shrub, was found wild on the *Rajamahl* hills by Mr. William Roxburgh, and by him introduced into the Botanic Garden at Calcutta, where it blossoms during the cold season.

EXPLANATION OF THE FIGURES.

Fig. 1. Part of a branch, with two branchlets ; natural size.
2. The calyx, and pistil, magnified. a. The five stigmas much magnified.
3. The corol, with the stamens laid open, and magnified.
4. The capsule, rather larger than natural.
5. Section of the same, more magnified.
6. A seed in its dry latticed aril.
7. A section of the same.

237. MORINDA ANGUSTIFOLIA.

Shrubby, erect. *Leaves* opposite to each other, or to a peduncle, lanceolate, bullate. *Flowers* solitary, short-peduncled. *Berries* distinct, succulent, four-seeded.

DESCRIPTION.

Trunk straight, with few erect branches. *Bark* light, ash-coloured. Height of the whole plant when six years old only about seven feet.

Leaves opposite, or single when a peduncle occupies the place of the other (as in *M. citrifolia* and *latifolia*,) subsessile, recurved, lanceolate, bullate, smooth, shining, entire, length about six inches, and less than two in breadth.

Stipules opposite, subcordate, interfoliaceous, remaining long after their respective leaves drop.

Peduncles solitary, short, seemingly terminal when they begin to blossom, but soon after the branchlet shoots out from between each peduncle, and its respective opposite leaf.

Heads solitary, globular, many (from 50 to 100) flowered.

Flowers pure white, in size and shape like those of the common jasmine.

Calyx only an almost entire marginal ring round the base of the tube of the corol.

Corol funnel-shaped.

Filaments very short, inserted rather below the middle of the tube of the corol. *Anthers* linear, hid in the middle of the tube.

Stigma exert, two-lobed.

Berries in general distinct, but a small proportion of them only comes to perfection; sessile, obovate, size of a large pea, succulent; deep shining black, with very dark coloured pulp.

Seeds four, each two-celled, with the inner cell larger and empty.

OBSERVATIONS.

This elegant shrub was found at *Chittagong* by Dr. Buchanan, and from thence sent to the Botanic Garden at Calcutta in 1798, where it blossoms in March, and the seeds ripen in May. Its root is used to dye with in like manner as that of M. citrifolia.

REFERENCES.

Fig. 1. A flower opened lengthways, rather magnified.
2. The receptacle with all the germs abortive, but two.
3. Section of a berry.
4. One of the seed, these three of the natural size.
5. Transverse section of a seed; a the seed: b the empty cell.
6. Perpendicular section of the same. These two are magnified.

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238. CEDRELA TOONA.

Leaflets from 6 to 12 pair, opposite, obliquely ovate-lanceolate, acute, entire. *Panicles* terminal. *Filaments* inserted into five glands which embrace the sessile germ.

Cuveraca, *Asiatic research. 4. p. 281. and 6. p. 352.*
Toon, Tunna, Tun, or Tuni of the Hindoos and Bengalese.

DESCRIPTION.

Trunk erect, often of a very large size, and height, though I have only seen small trees in the vicinity of Calcutta. *Bark* smooth and gray. *Branches* numerous, forming a large shady head.

Leaves alternate, abruptly-pinnate, drooping, from 12 to 18 inches long. *Leaflets* from 6 to 12 pair, opposite, or nearly so, short-petioleted, obliquely broad, lanceolate, tapering to a long sharp point, margin slightly waved, smooth on both sides; length from two to six inches.

Petioles, and *Petiolets* round and smooth.

Stipules none.

Panicles terminal, about as long as the leaves, drooping: composed of numerous, smooth, diverging, subdivided ramifications.

Bractes minute, deciduous.

Flowers numerous, small, white, and possess a sweet fragrance, like that of fresh honey.

Calyx, five-parted, expanding.

Corol, petals five, oblong, keeled on the back, margins ciliate, apexes incurved over the stamina.

Nectary, five, large, hairy, orange coloured glands round the base of the germ.

Filaments five, erect, shorter than the petals, inserted into the five glands of the nectary. *Anthers* sagittate, bent in toward the stigma.

Pistil, Germ oblong. *Style* length of the stamina. *Stigma* peltate, five-sided,

Capsule oblong, rather larger than a field bean, five-celled, five-valved, valves opening from the apex, and fall off with the seeds when they are ripe.

Seeds several in each cell, imbricated; both ends, and outer edge enlarged by a thin membranaceous wing; their insertion on the inner edges of the upper end of the five angles of the receptacle.

OBSERVATIONS.

A large, beautiful, timber tree; a native of *Bengal*. Leaves deciduous, about the beginning of the cool season; and appear again, with the flowers, in February; and the seeds are ripe in May and June.

The wood of this tree is very like mahogany, but lighter, and not so close in the grain. It is much used for furniture, and for various other purposes. The bark is powerfully astringent, and though not bitter, it has been found a good medicine in the cure of remitting and intermitting fevers; particularly when joined with a small portion of the powdered seed of *Guilandina Bonduccella*, (*Cutkaletchie* of the Bengalese,) which is a very powerful bitter.

EXPLANATION OF THE FIGURES.

Fig. 1. A flower in its natural state of expansion, magnified.
2. The same with the petals removed, which shows the nectarial glands, &c.
3. The capsule, natural size.
4. The same open, with the two front valves removed, exhibiting one cell (on the left) with the seeds, and another empty, which exposes one of the five sides of the receptacle; the dots on its upper end shew the insertions of the seeds.
5. A seed. The last two are magnified.

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239. ASCLEPIAS TINGENS.

Shrubby, twining, smooth. *Leaves* cordate. *Umbels* subaxillary, proliferous. *Corol*, salver-shaped; inside of the tube with five double ciliated ridges. *Stigma* globular, half hid.

DESCRIPTION.

Stem twining, woody, with numerous twining, smooth *branches*, extending far over whatever supporters they meet with. *Bark* pretty smooth, when young brownish; when old ash-coloured.

Leaves opposite, petioled, cordate, entire, pointed, smooth on both sides; from three to six inches long, and from two to four broad.

Petioles about an inch long, channelled, smooth.

Umbels subaxillary, short-peduncled, compound.

Pedicels rather longer than the peduncles, one-flowered, smooth, diverging in all directions.

Flowers numerous, pale yellow, or cream colour when they first expand, but grow gradually darker.

Calyx to the base five-cleft.

Corol: Tube as long as the fructification; on the inside run five double ridges, ciliated with short brown hairs: Border expanding; divisions obliquely-oval.

Nectary as in the genus, with the cordate divisions of its mouth covering the stamina, and lower part of the stigma.

Stamina: Receptacles affixed to the base of the stigma: *Anthers* nearly erect.

Pistil: Style single. *Stigma* globular, smooth, pearl-coloured, half hid in the mouth of the tube; round its under side ten pits are found corresponding with the ten anthers.

OBSERVATIONS.

A large, twining, shrubby plant; brought from *Pegu* to the Botanic Garden at Calcutta, by Dr. Buchanan. Flowering time the rainy season.

Dr. Buchanan informed me, that from the leaves of this plant the Burmah people prepare a green dye. It is probable that those people forgot to inform the Doctor that it was necessary to dye the cloth yellow, either before or after the application of the colour prepared from the leaves of this plant.

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240. ASCLEPIAS TENACISSIMA.

Perennial, twining. *Leaves* long, petioled, exactly cordate, fine-pointed, both sides soft with down. *Panicles* interfoliaceous drooping. *Genitalia* obovate, hid in the tube of the corol. *Follicles* ovate-oblong, obtuse, tomentose.

DESCRIPTION.

Stem perennial, twining over the trees, &c. to a very great extent, and in general about as thick as a large ratan. *Branches* few; *young* shoots downy. From wounds there exudes a milky juice, which thickens into an elastic substance, very like *caouchouc*, and rubs out black lead pencil lines as readily, and I think may be reckoned an additional species thereof.

Leaves opposite, (the pairs in luxuriant shoots fit for flax) very remote, petioled, exactly-cordate, fine acute-pointed, entire, very soft, with much fine down on both sides; general length from 4 to 6 inches, and from 3 to 4 broad.

Petioles round, downy, from two to four inches long.

Panicles interfoliaceous, large, drooping, composed of alternate

drooping branches, of numerous, small umbellets, of beautiful greenish yellow flowers.

Bractes minute, two or three under the insertion of the fascicles of flowers, which compose the umbellets.

Calyx deeply five-cleft; *divisions* rather more than half the length of the tube of the corol, and downy on the outside.

Corol salver-shaped; divisions of the border obliquely oval, with apexes rounded, greenish toward the centre, with the exterior half yellow.

Column of the fructification short-clavate, or obovate, about as long as the tube of the corol, with the white apex of the common stigma naked.

Follicles ovate-lanceolate, obtuse, nearly round, with a groove on the inside; clothed with much soft velvet-like green down, about six inches long, and from four to five in circumference where thickest.

Seeds very numerous; obovate, thin, with a broad thin membranaceous margin, and long soft silky pappus.

OBSERVATIONS.

This most elegant and very useful species, was first made known to us by Mr. William Roxburgh, who found it growing wild on the above mentioned hills in 1800, and by him introduced into the Botanic Garden at Calcutta, where the plants thrive luxuriantly, blossom in April, and ripen their seed about ten months thereafter.

The bark of the young luxuriant shoots yields a large portion of beautifully fine silky fibres, with which the mountaineers of Rajemahl make their bow-strings, on account of its great strength and durability.

During the rains they cut the shoots into lengths at the insertion of the leaves, peel off the bark, and with their nails, or a bit of stick on a board, remove the pulpy part. A person accustomed to this work will, I am told, clean as far as six pounds of the fibres in a day.

These fibres, and those of the bark of the Malay plant *Battang culloway* or *poolas*, are by far the strongest (I mean in the vegetable kingdom) I have met with; far exceeding those of the leaves of *Sanseviera zeylanica*. A line made of common hemp, for a standard, broke with 158 pounds when dry, and with 190 when wet, the average of several trials.

A similar line of this substance, broke with 248 when dry, and 343 when wet, while one of Battang calloway broke with 240 when dry, and 278 when wet.

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241. STAPELIA UMBELLATA.

Umbel terminal. *Corol* five-parted, smooth; segments triangular, with margins revolute. *Stem* and branches erect, four-sided, with the angles dentate.

DESCRIPTION.

Stems perennial, erect, with erect *branches*, four-sided, smooth, angles sharp, and dentate, height of the whole plant about a foot.

Leaves (or scales) minute, cordate, solitary on the teeth of the angles of the young shoots.

Umbel terminal, many (from 40 to 100) flowered.

Peduncles longer than the diameter of the expanded corol, one-flowered, round, smooth.

Calyx minute.

Corol subcampanulate; *border* five-parted; *divisions* triangular, but as the margins become revolute, they become more pointed; inside dark bistre, with five transverse waved yellow rugæ; outside dark purple; expands about one inch.

Follicles erect, subulate, 6-8 inches long, and about as thick as a common quill.

OBSERVATIONS.

A native of the dry, barren, bushy places, especially under the shade of the Euphorbia Antiquorum, over *Mysore;* and from thence the plants were first procured by Lady Clive, who sent several to the Botanic Garden at Calcutta, where they blossom about the close of the hot season, or beginning of the rains in May and June.

242. BURMANNIA DISTICHA.

Linn. sp. pl. ed. Willden. 2. *p.* 16.

Leaves sword-shaped. *Spike* double.

Burmannia spica gemina. *Burm. zeyl. p.* 50. *t.* 20. *f.* 1.

DESCRIPTION.

Root of numerous capillary fibres, annual.

Leaves radical, sword-shaped.

Scape erect, from twelve to twenty inches, round, jointed; with a sword-shaped sheath at each joint.

Spike double, spreading in opposite directions.

Bractes lanceolate, one-flowered.

Flowers erect, subsessile on the upper side of the spikes, pale blue.

Calyx above, gibbous, one-leaved; mouth six-parted, the alternate *divisions* larger, permanent, and keeled on the back.

Corol none, except the three smaller divisions of the calyx be so called.

Filaments none. *Anthers* three pair, adjoined to the sides of three large, ox-head-shaped glands, affixed to the calyx, just below the smaller divisions thereof.

Pistil, Germ three-sided, three-winged, being a continuation of those of the calyx. *Style* erect. *Stigmas* three, large, emarginate.

Capsule three-winged, three-cornered, three-celled, three-valved.

Seeds numerous.

OBSERVATION.

A native of Ceylon.

243. BAMBUSA BACCIFERA.

Arboreous, unarmed. *Pericarp* a very large pendulous, pyramidal, one-seeded berry.

Beesha, *Rheed. Mal. vol.* 5. *p.* 119. *t.* 60.

Payu-tullu, of the people of the Chittagong mountains.

DESCRIPTION.

Leaves alternate, bifarious, subsessile on their sheathing bases, ovate-lanceolate, smooth on both sides, slightly ribbed underneath, length from 6 to 12 inches, and from two to four broad.

Sheaths of the leaves villous, with their mouths bearded with many, long, filiform fibres.

Spikes compound; they issue, many together, from the joints of the branches, or from those of the upper part of the stem; long, slender, jointed, ramous; each joint furnished with a sheath of nearly its length.

Spikelets three, four, or more flowered: the inferior scales (calyx?) thereof abortive, or with male flowers.

Corol of two, unequal, long, taper, acute-pointed, smooth, permanent valves.

Stamina six, about as long as the pistil.

Germ ovate. *Style* single. *Stigmas* three, filiform, woolly.

Pericarp. In this singular species, it is a very large, hard, fleshy, conical, smooth, taper curved-pointed fruit, with a single large oval seed in each.

OBSERVATIONS.

This uncommonly curious berry-bearing bamboo, is a native of the *Chittagong* mountains.

Growing plants, seeds, and well preserved specimens, were sent me from thence by Mr. Pierard, a gentleman to whom the Botanic Garden at Calcutta is under many obligations. This Bamboo, he writes, is the one in common use in that country for every purpose of building, &c. His description of the tree is so full, and perfect, that I do not think I can do better than transcribe what he says, in reply to my queries regarding this plant.

" It bears no thorns, grows in dry places, chiefly on the sides " of hills, where the upper stratum of the soil is sandy. The " circumference near the base 12 or 13 inches. Height from 50 " to 70 feet, beautifully erect, and without the least flexure, or " inequality of surface, bare of branches, except near the extre- " mity. Perishes after yielding its fruit.

" It yields more or less Tabasheer of a saline crystallization; " sometimes it is said the cavity between the joints is nearly " filled with this substance, which the people call choonah (lime)."

EXPLANATION OF THE FIGURES.

Fig. 1. A joint of the upper part of the stem of a tree in blossom, at which time the plant is in general destitute of leaves.

2. The end of a small twig in leaf.

3. A small branch, with one of the fruit hanging to it.

All these are of their natural size, &c.

4. Part of a spike, with one of the spikelets, a, having the last flower thereof a fertile hermaphrodite one.

5. The last mentioned hermaphrodite flower still more magnified, with the two valves of the corol a a removed to show the stamina and pistil.

6. A perpendicular section of one of the fruit (and rather a small one) exposing the entire seed beginning to vegetate. a, part of the scaly pedicel by which it was united to the branch. b the roots. c the plumula, or young ascending scaly shoot.

244. EURYALE FEROX.

Euryale ferox. *Salisb. in annals of bot.* 2. *p.* 73. *Hort. Kew. ed.* 2. *v.* 3. *p.* 296.

Anneslea spinosa. *Andrews's reposit.* 618.

DESCRIPTION.

Root consists of numerous, thick, fleshy fibres, which descend deep into the soil at the bottom of the water the plant grows in.

Stem none.

Leaves radical, with petioles sufficiently long to admit of their floating on the surface of the water, peltate, from orbicular to oval, entire, upper surface dull green, with ferruginous veins, and armed with but few, very slender prickles; underneath a most beautiful purple, and there reticulated with numerous, very large, prominent, dichotomous, finally anastomosing veins; armed with long, straight, very sharp, tolerably strong spines: size from one to four feet each way.

Petioles round, and also armed with straight spines.

Peduncles radical, one-flowered, round, and also armed with straight spines; if the water is shallow, they are generally so long as to elevate the flower above its surface; but if deep they blossom under water.

Flowers small for the size of the plant, colour a lovely blue violet.

Calyx four-leaved, inserted on the crown of the germ, armed on the outside with recurved spines; inside smooth, and coloured.

Corol, petals about twenty, narrow, ovate-oblong, the exterior ones nearly as large as the calyx, gradually lessening till they become very small, and nearly colourless next to the stamens.

Filaments numerous, and like the petals, lessening toward the centre. *Anthers* oval.

Pistil. Germ beneath, ovate, armed. *Style* none. *Stigma* cup-shaped, with the margin only slightly marked with six or eight elevations.

Berry size of a goose egg, armed, irregularly ovate. The internal divisions obscure, and irregular.

Seeds, or rather nuts, about twenty, nearly round, size of a small cherry, each enveloped in its own, proper, coloured aril.

OBSERVATIONS.

Is a native of the sweet-water lakes, and ponds, over *Tipperah, Chittagong*, &c. to the eastward of Calcutta; where it blossoms most part of the year, and is known to the natives of those countries by the name *Mackannah*.

The seeds are farinaceous, much liked by the natives, and sold in the public bazars to the eastward of the mouths of the Ganges, where the plant is indigenous. The preparation to fit them for the table is as follows: A quantity of sand is put into an earthen vessel, placed over a gentle fire. In the sand they put a quantity of the seed, agitate the vessel or the sand with an iron ladle until the seed swells to more than double its original size, when it becomes light, white, and spongy; during the operation the hard husk of the seed breaks in various parts, and then readily separates by rubbing between two boards, or by striking gently with a board. The Hindoo Physicians consider those seeds to be possessed of powerful medical virtues; such as restraining seminal gleets, invigorating the system, &c. &c.

EXPLANATION OF THE FIGURES.

Fig. 1. Two of the leaves, smaller than they generally are, the under surface of the anterior one is represented, and the lower edge of the upper surface of the posterior one.
2. Part of the flower-stalk, and flower in its usual state of expansion.
3. A vertical section of a flower.
4. The same of the seed vessel.
5. A transverse section.
6. The seed enclosed in its aril.
7. The same without the aril.
8. A vertical section of the same.

Except the two leaves, all the rest are of their natural size.

COLEBROOKEA.*

Smith Exot. bot. 2. *p.* 111.

DIDYNAMIA GYMNOSPERIMA.

GENERIC CHARACTER.

Aggregate. *Common perianth* imbricated. *Proper* beneath, five-cleft. *Corollets* one-petalled, irregular. *Germs* four. *Seeds* from one to four. *Receptacle* naked.

245. COLEBROOKEA TERNIFOLIA.

Shrubby, erect. *Leaves* three or four-fold, lanceolate, obtusely serrulate.

DESCRIPTION.

Trunk (in three and four year old plants, of about five feet in height,) short, woody. *Bark* light brown, and pretty smooth. *Branches* three or four-fold, ascending young shoots downy.

Leaves three and four-fold, petioled, drooping, lanceolate, serrate, soft, with much very fine down, from four to six inches long, and from one to two broad.

Petioles round, very downy, about an inch long.

Stipules none.

Panicles terminal, erect, composed of generally three-fold, cylindric, amentaceous spikes, closely covered with numerous, minute, aggregate, white flowers.

Calyx. Common perianth, 10 - 20 leaved, many-flowered, imbricated, permanent. *Proper perianth* deeply five-parted; *divisions* subulate, nearly as long as the florets, clothed with much, long, soft, fine, white wool. These divisions lengthen much, and become more woolly by the time the seeds are ripe; giving to the aments, or ramifications of the panicle, a much larger, and more woolly appearance, than when in blossom, as represented at fig. 8.

Corol: Universal equal. *Proper* monopetalous. *Tube* short. *Border* four-parted: upper division emarginate; the other three ovate, of which the middle one is longer and broader.

Filaments four, of which two are shorter. *Anthers* small.

* The genus is named Colebrookea, in honour of Henry Colebrooke, Esq. whose knowledge in the science justly demands this tribute.

Pistil. Germs four, hairy. *Style* the undivided part the length of the tube of the corol, and seems composed of two portions, as in Perilla. *Stigma* two-cleft, and about as long as the undivided part of the style.

Pericarp none.

Seeds from one to four, but generally one, and then nearly oval, or round, and hairy; when more than one they adhere slightly to each other; the long woolly segments of the calyx readily carries them with the wind to a great distance.

Receptacle naked, flat.

OBSERVATIONS.

A native of *Mysore*, from whence the seeds were sent by Dr. Buchanan, to the Botanic Garden at Calcutta, where the shrub blossoms during the months of February and March.

EXPLANATION OF THE FIGURES.

Fig. 1. Outside of the common calyx.
2. Inside of the same, and the disk of the receptacle.
3. One of the florets.
4. The proper calyx laid open, which exposes the pistil to view.
5. A floret laid open.
6. The four ripe seeds, with the enlarged woolly calyx. It, however, rarely happens that more than one of the seeds ripen.

As at fig. 7. the other three are abortive, and appear like three hairy scales at the base of the ripe seed.

8. A small ramification of the panicle, where the seeds are ripe.

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246. GMELINA ARBOREA.

Arborous, unarmed. *Leaves* cordate, entire, downy. *Panicles* terminal.

Gumbharee, the Sanscrit name.
Gumhar, or Gumaar *Asiat. resear.* 6. *p.* 366.
Gumhar, of the Hindoos.
Cumbulu. *Rheed. mal.* 1. *t.* 41.
Goomady, of the Tamuls.
Tagoomoodu, of the Telingas.
Jugani-chookor, of the Bengalese.

DESCRIPTION.

Trunk nearly straight, and of great size, for I have seen logs of the wood thirty feet long, and three square. *Bark* ash-coloured, in young trees smooth. *Branches* long, spreading, and drooping, in every direction. Some trees in the Botanic Garden at Calcutta, of only four years growth, had trunks 18 inches in circumference, four and a half feet above ground, and were high in proportion.

Leaves opposite, petioled, cordate, pointed, entire, above a little downy, below much so, and very soft; length from four to eight inches, and from three to six broad: deciduous about the beginning of the cool season, and appear again with the flowers in March and April. In young trees the leaves are larger than in the old; it is a luxuriant branchlet of a young tree that is figured.

Petioles from two to four inches long, round and downy.

Panicles terminal, and from the exterior axills every part clothed with soft down; composed of simple, decussated branches.

Bractes opposite, lanceolate, villous.

Flowers opposite, short pedicelled, drooping (though not well represented so in the figure,) large, of a dull ferruginous yellow colour.

Calyx small, obscurely four or five-toothed.

Corol. Tube obliquely campanulate. *Border* unequally four-parted; upper division shorter and bifid; the under greatly longer, and concave.

Filaments, both pairs incurvate. *Anthers* bifid from the base.

Style length of the filaments. *Stigma* of two, unequal, spreading, acute lobes.

Drupe, size of a large olive, roundish-oval, smooth, when ripe yellow. *Nut* single, hard, with from one to four one-seeded cells, but it rarely happens that all the four ripen.

OBSERVATIONS.

A large timber tree, a native of the various mountainous parts of *India*. Flowering time the beginning of the hot season.

The wood is so very like Teak, as to have been brought to Calcutta for such. It is, however, lighter, and lighter coloured, and void of the bitter taste, and smell peculiar to Teak. It is used by the natives for various purposes.

Specimens taken from a very large log, which were kept three years in the river Hoogly, a little above low water mark; where the worms (*Teredo navalis*) are thought to be most destructive, have been deposited in the Honourable East India Company's Museum at the India House, to shew how completely this wood resisted the worm, so destructive to almost every other sort in similar situations. And before I left India, similar specimens were also presented to the Governor General, the Marquis Wellesley; and to Mr. Thornhill, the master-attendant, with the view of having it tried in various ways in ship-building. From the same log the above mentioned specimens were taken, which was about 30 feet long, and about three square; and brought from the skirts of the mountains north of Patna. I caused two valve flood-gates to be made, to keep the tides out of the Botanic Garden: other similar gates made of Teak were in use in other places of the garden for the same purpose; and after very fair trials, the Goomar wood had evidently the advantage, as they remained sound and entire in every part, while those of Teak began to decay about the edges. There is therefore reason to think, it will prove a valuable acquisition to the marine yard; and I trust there will soon be fair, and sufficiently extensive experiments made with it, both for planking, and square, straight, and crooked timbers. At Calcutta these are particularly wanted, as the *Sissoo*, now in use, is not so durable as the Teak used on the Malabar coast; and it is thought that the ships built at Calcutta, are not so durable as the Bombay ships on that account alone. It is therefore needless to enlarge on the value of a substitute that will last as long as the Teak plank on the outside, to the shipping interest of Calcutta at least, until the Teak tree is sufficiently plenty in Bengal, a period, I hope, not very distant, as it is now very generally and successfully cultivated over many parts of that country, where it thrives remarkably well. The largest trees in the Botanic Garden at Calcutta were, in 1804, about nineteen or twenty years old; they had then trunks from 42 to 44 inches

in circumference, four and a half feet above ground, and were high, ramous, and healthy in proportion. These were originally sent, at the desire of the late Marquis Cornwallis, from the Rajahmudry Circar, where the Teak is reckoned superior to every other sort in India. It is from the seed of these trees the plants have been reared, which are now so generally planted over Bengal.

Since writing the above, Mr. Waddell, the East India Company's master builder in Bengal, has returned from thence to England; and informs me, that in consequence of my having found a log of this timber resist the worm (*Teredo navalis*) so effectually, he fixed specimens of several sorts of timber considerably below low water mark, in the same river my experiment was made in, so that they were constantly under water. At the end of one year he took them up, and found the worm had attacked this sort, though in a less degree than some of the others. I have no doubt of Mr. Waddell's accuracy; and can only say that my own experiment and the result were exactly as I have stated. Whether Mr. W. made his experiment on wood equally old; or if it was the same sort, remains to be ascertained.

247. BOMBAX HEPTAPHYLLUM.

Linn. sp. pl. ed. Willden. 3. p. 732.

Trunk and branches much armed. *Leaves* digitate. *Stamens* numerous, in two series, exterior series of five fascicles. *Stigma* five-cleft.

Moul elavou. *Rheed. mal. 3. p. 61, t. 52.*
Salmali, the Sanscrit name.
Semel, or Semul, of the Bengalese, and Hindoos.
Boorgha, of the Telingas.

DESCRIPTION.

Trunk straight, covered with innumerable, crowded, short, sharp conic *prickles*, as at a, of which b is a vertical section: the *Bark* is also very scabrous, and deeply cracked, is outwardly ash-coloured, inwardly red. *Branches* subverticelled, variously bent, but generally in a horizontal direction, and armed like the trunk.

Leaves alternate, long-petioled, digitate.

Leaflets five, six, or seven, petioleted, broad-lanceolate, long, fine-pointed, entire, smooth on both sides, general length from 6 to 12 inches.

Petioles longer than the leaflets, round, smooth.

Petiolets short, channeled on the upper side.

Stipules small, caducous.

Flowers numerous, collected in fascicles at and near the extremeties of the then otherwise naked branchlets, subsessile, very large, bright lively red colour; they contain a large portion of sweet liquid, which birds are fond of.

Bractes small, caducous.

Calyx cup-shaped, circumcised, of a thick leathery texture, inside covered with white, silky down; outside pretty smooth. *Border* in general obscurely three or four-parted; as the corol expands, these are often so much split, as to appear four, five, or more cleft; separating near the permanent base, which with the corol and stamina drop off in one body.

Corol of five, very distinct, oblong, first spreading, then recurved, contorted, smooth, deep red, fleshy, oblong petals, of about twice the length of the stamens.

Stamens. *Filaments* in two series. The inner press on the style, and consist of five longer, and thicker; and ten shorter. Exterior series contain from 50 to 60, united into five distinct bodies; all these are united at the base into one fleshy envelope round the germ. *Anthers* incumbent, involute, reniform; of the five larger filaments of the interior series double; on all the rest single. *Pollen* the colour of Scotch snuff.

Pistil. *Germ* conical. *Style* longer than the stamina. *Stigma*, five-cleft; divisions subulate, recurved.

Capsule oblong, tapering equally towards each end, five-celled, five-valved, downy on the outside.

Seeds numerous, obovate, smooth, except for a sharp cross-shaped ridge on one side; immersed in a very large quantity of very fine, silky wool; this wool does not adhere to the seeds, but rather seems to grow from the inside of the valves of the capsule.

OBSERVATIONS.

This is one of the largest of our Indian trees, and is found almost every where. Over the northern *Circars*, near the mountains, they grow to a greater size than I have seen any where else, often about an hundred feet high, thick in the trunk, and ramous in proportion. Flowering time the end of winter, when the tree is totally destitue of leaves. The great numbers of very large bright red flowers, with which it is then covered, makes it remarkably conspicuous at a very great distance.

The wood is white, light, and spongy, fit for very few purposes. In India the wool of the seeds is used to stuff beds and pillows with, and to put between the folds of quilted cloth.

FLEMINGIA.*

DIADELPHIA DECANDRIA.

GENERIC CHARACTER.

Calyx five-cleft. *Banner* striated. *Stamina* one and nine. *Legume* sessile, oval, turgid, two-valved, one-celled, containing two spherical seeds.

248. FLEMINGIA STRICTA.

Stems nearly simple, and straight. *Leaflets* broad-lanceolate, smooth. *Racemes* axillary, solitary, length of the petioles.

Guidda of the Telingas.

DESCRIPTION.

Stems several from the same root, straight, with few straight, somewhat three-sided smooth branches.

* So named in honour of Dr. John Fleming, President of the Honourable East India Company's medical establishment in Bengal; whose knowledge of the science of Botany justly demands this tribute.

Leaves alternate, petioled, ternate. *Leaflets* broad-lanceolate, entire, acute, smooth; about nine inches long, and three broad. Petioles five or six inches long, three-sided.
Stipules sheathing, very large, scariose, caducous.
Racemes axillary, solitary, erect, about as long as the petioles, supported on a short peduncle, which is hid in a large, scariose, spathiform bracte.
Flowers numerous, alternate, short-pedicelled, beautifully striped with pink, yellow, and violet.
Bractes solitary, one-flowered, linear-lanceolate, caducous long before the flowers expand.
Calyx unequally five-cleft, the lower division being considerably larger than the other four.
Filaments one, and nine conjoined.
Legume oblong, acute, sessile, turgid, smooth.
Seeds uniformly two, perfectly round, smooth, speckled brown and white, scarcely so large as a grain of black pepper.

OBSERVATIONS.

A native of the hills over the northern parts of the coast of Coromandel, where it blossoms during the cool season.

249. FLEMINGIA SEMIALATA.

DESCRIPTION.

Shrubby, ramous, suberect. *Leaflets* elliptic, smooth; *petioles* winged: *racemes* terminal, and axillary, panicled.
Leaves ternate: *leaflets* nearly equal, broad-lanceolate, three-nerved, entire, fine-pointed, smooth on both sides, length from 4 to 6 inches, and from one and a half, to two broad.
Petioles shorter than the leaves, with broad, membranaceous, villous margin.
Racemes axillary, and terminal, generally compound, particularly the terminal, and they are often panicled.
Bractes chaffy, lanceolate, one-flowered, caducous.
Flowers numerous, large, rose-colour, striated with greenish yellow and purple.
Calyx villous; *segments* 5, nearly equal, ensiform, about as long as the corol.
Filaments: 1, and 9; the single one greatly enlarged near the base.
Legume sessile, oval, slightly villous, turgid, size of a field bean.
Seeds two, small, perfectly round, smooth, shining black.

OBSERVATIONS.

A native of *Nepaul*, from whence Dr. Buchanan sent seeds to the Botanic Garden at Calcutta; where, in little more than one year, the plants were tall, elegant, ramous, stout, erect shrubs; with the *bark* of the ligneous parts dark brown, and smooth: of the tender parts villous.

ARTOCARPUS.

Gen. pl. ed. Schreb. n. 1393.

GENERIC CHARACTER.

Male and *Female* florets on (the outer surface of) different amentaceous receptacles.
Male. *Perianth* two or three-leaved. *Corol* none.
Female. *Perianth* one-valved. *Corol* none. *Style* one.
Fruit compound.

250. ARTOCARPUS INTEGRIFOLIA.

Leaves entire: *Flowers* cauline.

A. integrifolia. *Linn. spec. plant. edit. Willd.* 4. *p.* 189.
Sitodium cauliflorum. *Gært. sem.* 1. *p.* 345. *t.* 71 *and* 72.
Polyphema Iaca. *Loureiro cochin. p.* 546.
Tsajaca-marum. *Rheed. mal.* 3 *tab.* 26, 27 *and* 28.
Soccus arboreus. *Rumph. amb.* 1. *tab.* 30 *and* 31.
Panasa, the Sanscrit and Telinga name.
Kauthol, of the Bengalese.

DESCRIPTION.

Trunk short in proportion to the size of the tree, and when full grown, from 8 to 12 feet in circumference, covered with dark-coloured, deeply-cracked bark. *Branches* numerous, spreading far in every direction.
Leaves alternate, short-petioled, oval, or oblong; in young luxuriant plants often deeply divided; upper surface a smooth deep-shining green: general length about six inches, and about three broad.
Stipules in pairs, broad-lanceolate, embracing, like a spathe, the next inner leaf, and ament when present, caducous.
Male aments axillary, solitary, peduncled, sub-cylindric, about the size of a man's thumb; they are found only on short branchlets which issue from the trunk, or largest branches, and are every where closely covered with small sessile florets.
Spathe no other than the stipules above mentioned.
Perianth proper or *Corol* two-valved. *Valvulets* wedge-shaped, equal, a little hairy, united, with the base of the filament, into one body.
Filament single, clavate, rather longer than the calyx. *Anthers* two, on the rounded margin of the apex of the filament, two-lobed.
Female aments on the same branchlet with the male, but lower down, and generally but one on the same branchlet, though there are many male; and when they first burst from the spathiform stipules, they are nearly of the same size, and equally well furnished with florets.
Perianth proper or *Corol*, of one sub-cylindric, fleshy *tube*, perforated at the apex, or it may probably be better termed the exterior coat of the germ, for it becomes the edible part of the fruit.
Germs numerous, ovate, lodged in the base of what I have just called the proper perianth. *Style* longer than the perianth. *Stigma* single, clavate, recurvate, grooved on the convex side.
Fruit compound, oblong, muricate, from 12 to 30 inches long, and from 6 to 12 in diameter; and weighing from ten to sixty pounds.
Seeds reniform, about the size of a nutmeg, very smooth, each lodged in a thin, smooth, somewhat coriaceous membrane; which is again covered by the edible, thick, fleshy coat; (formerly my proper perianth.)

OBSERVATIONS.

A large tree, very generally cultivated over the warmer parts of *Asia*. It does not, in general, attain to any great height ; 30 or 40 feet may be reckoned a high tree ; but with a very extensive, densely ramous, ever-green, shady head ; particularly when standing single. Flowering time the cool season ; fruit ripe in four or five months thereafter.

The fruit of this tree is so universally well-known, that it is unnecessary to say any thing respecting it ; nor of the seeds, which, when roasted, are not inferior to chestnuts. In Ceylon, where the tree grows most plentifully, and where the fruit attains its greatest size, and perfection, it forms a considerable part of the diet of the natives, at particular times of the year.

The wood is like mahogany in colour, after it has been some time exposed to the air, and in some parts of India is used to make furniture of.

The Hindoos prepare bird-lime from the tenacious, milky juice, which abounds in all the uneatable parts of the fruit, and young, tender parts of the tree.

EXPLANATION OF THE FIGURES.

The principal figure is a flower-bearing branchlet issuing from the trunk ; natural size.

a. An entire male floret. b. The same with one of the valvulets removed, to shew the stamen.

c. An entire female floret. d. A vertical section of the same, which exposes the pistil. These four are much magnified.

251. HEDYCHIUM ANGUSTIFOLIUM.

Leaves linear-lanceolate. *Spikes* open ; *fascicles* of flowers subtern. *Segments* of the cleft lip oblong ; the other five segments of the corol all linear.

Hedychium angustifolium. *Botan. Regist.* 157.

Bow-ada, the Hindoo name.

Native of *Chittagong*, *Silhet*, and eastern parts of *Bengal*, where it flowers about the beginning of the rains in June.

DESCRIPTION.

Root tuberous, horizontal, jointed, &c. as in the other *Scitaminous* plants. *Stems* erect, 3-6 feet high, entirely invested in the sheaths of the leaves. *Leaves* bifarious, sessile on their smooth sheaths, narrow-lanceolate, very fine, I may say filiform, pointed, smooth on both sides ; length 10-14 inches, by 1-2 broad.

Spike terminal, erect, rigid, 6-18 inches long, smooth. Fascicles of flowers generally three-fold, and spread out considerably from the *rachis*.

Bractes exterior of the fascicle cylindrically-linear ; *interior* one to each flower, and smaller.

Flowers, rather small, dull red, (lateritious), generally about four in the fascicle, and expand in succession.

Calyx superior, cylindric, length of the tube of the corol ; *mouth* unequally 3-toothed.

Corol. *Tube* slender, cylindric, about an inch long ; 5 segments of the border linear, (sub-filiform,) variously revolute. Lip

lateral, with linear, channelled *claw*, and two parted *lamina*, the *segments* thereof semi-oval.

Filament opposite to the lip, and twice its length, nearly straight, filiform, grooved for the style. *Anther* two-lobed, naked.

Germ oval, a little hairy, 3-celled, with many *ovula* in each, attached to the axis. *Style* filiform, its base embraced by the usual two subulate bodies. *Stigma* funnel form, projects from the apex of the anther.

Capsule oval, smooth, size of an olive, 3-celled, 3-valved, opening from the apex.

Seeds numerous, bright lucid red, and partly invested in a deep red, laciniate aril.

Embryo simple, sublanceolate, both ends obtuse, and amply furnished with both albumen and vitellus.

HEDYCHIUM GRACILE R.

Leaves lanceolar. *Spikes* terminal, open, *flowers* solitary, scattered ; *segments* of the bifid short-clawed lip semi-lanceolar, the other five linear.

Catteah lauffear. Hind.

OBSERVATIONS.

A slender species, of about three feet in height ; a native of the *Garrow* hills, and like the former, blossoms during the rainy season. Its white solitary flowers, and lanceolar leaves, readily distinguish it from *angustifolium*.

Of this species the outline of a leaf, and a single dissected flower are figured, at the bottom of tab. 151.

252. ALPINIA COSTATA Roxb.

Leaves linear-lanceolar, villous underneath. *Spikes* radical, lax. *Lip* ovate-lanceolate, entire. *Capsules* pedicelled, ovate-oblong, nine ribbed.

OBSERVATIONS.

A native of the hilly countries in the vicinity of *Silhet*, where the plant is called Dow-Terrah. It blossoms about the beginning of the rains, in June : and the fruit ripens in September, when they are gathered, and sold to the dealers in drugs.

DESCRIPTION.

Root tuberous, &c. as in the other species.

Stems in clusters from the same root, from erect in the centre, to patent on the outside of the clump, invested in the sheaths of the leaves, 2-4 feet high, and about as thick as a slender walking cane.

Leaves petioled above their sheaths, linear-lanceolar, downy underneath ; 2-3 feet long, by 2-4 inches broad.

Sheaths villous, and rise in an obtuse ligula above the insertion of the leaf.

Spikes radical, oblong, laxly-imbricated, rising but little above the earth ; lower part, or scape, hid in the soil, and clothed with shorter scariose bractes.

Flowers numerous, large, red, fragrant.

Bractes: *exterior*, one under each flower, lanceolate, ribbed, smooth, pale yellowish pink; *interior* or *inferior perianth* tubular, length of the proper perianth.

Calyx superior, length of the tube of the corol, tubular, with 3-toothed, coloured apex.

Corol. *Tube* cylindric, long and slender; *segments* of the border linear-oblong, obtuse. *Lip* with pretty broad cordate base, from thence taper to its entire obtuse point, greatly longer than the segments of the exterior border, margins curled.

Filament, anther, germ, style, stigma, and nectarial bodies as in the genus.

Capsules pretty long-pedicelled, ovate-oblong, while fresh above an inch and a half long, and nearly one in diameter, 3-celled, somewhat 3-lobed, each angle marked with a longer vertical rib, and two smaller on the sides, between the large ones.

Seeds numerous, obovate, a groove on one side. *Integuments* 2; *exterior* soft, and while fresh, it may be called the succulent aril: *interior* white, firmer, and rugose.

Albumen conform to the seed, white and friable, perforated by a spongy brown substance above the embryo.

Vitellus somewhat hyaline, and rises on each side of the perforation like two horns.

Embryo subclavate, its small end lodged at the umbilicus.

OBSERVATIONS.

The form of the capsules (which is not unlike *Gærtner's Zingiber Ensal*) and the acrid aromatic taste of the seed, induces me to believe it to be the plant which furnishes the *Middle Cardamom*, or *Cardamomum medium* of our writers on the materia medica.

253. ZINGIBER LIGULATUM Roxb.

Leaves approximate, sessile, lanceolate. *Spikes* lax, more than half hid in the earth, obovate. *Bractes* cuneiform. *Lip* subhastate.

OBSERVATIONS.

A native of *Hindustan*. Flowering time, in the Botanic Garden at *Calcutta*, the rainy season.

DESCRIPTION.

Root jointed, running horizontal, at some depth under the surface of the earth, and furnished with long fleshy fibres from the joints; from these joints shoots spring, and by them the plant is readily propagated.

Stems about two feet high, bending considerably to one side.

Leaves alternate, approximate, bifarious, sessile on their sheaths, from cordate below, to lanceolate toward the top of the plant; both sides smooth, and marked with parallel veins, the under a paler green; length from three to twelve inches, and about four broad.

Sheaths smooth; from the mouth of each rises a remarkably large long strap, or ligula, which, by the growth of the plant, becomes bifid, and by age scariose.

Spikes radical, half hid in the earth, oblong, loosely imbricated with cuneiform, pink coloured, one-flowered, exterior scales, or bractes; and the same number of inner, colourless, tridentate, shorter bractes, or they may be called inferior perianths.

Calyx superior, one-leaved, spathiform, about half the length of the tube of the corol, irregularly tridentate.

Corol. *Tube* slender, the length of the exterior scales of the spike, incurved. *Exterior border* of three, nearly equal, linear, acute, smooth, reddish divisions. *Inner (Nectary Linn.)*, oblong, obtuse, margins much curled; two expanding, more or less acute, lobes, at the very base; colour, a pale yellow.

Filament short, below the two-lobed *Anther* linear, above it ends in a long, taper, curved, grooved beak.

Germ oval, villous, three-celled, each contains many ovula, attached to a central receptacle. *Style* very slender, and as long as to elevate the funnel-shaped ciliate *stigma* even with the apex of the filament.

Nectarial scales long and slender, embracing the base of the style within the bottom of the tube of the corol.

Capsule ovate, size of a large olive, three-sided, 3-celled, 3-valved, opening from the apex down the angles, inside of the cells crimson. *Cortex* leathery, striated, pale dull yellowish straw colour.

Seeds many, oval, blackish brown, a little rugose, arilled. *Aril* white, nearly complete, and ragged at the upper end.

Albumen conform to the seed, cinereous.

Embryo cylindric, central, nearly as long as the perisperm.

MILLINGTONIA Roxb.*

DIANDRIA MONOGYNIA.

NATURAL ORDER SAPINDI. Juss.

GENERIC CHARACTER.

Calyx 3-leaved, (and calycled). *Corol* 3-petalled, a nectarial scale on the inside of each. *Germ* superior, 2-celled, cells 2-seeded. *Drupe* with one or two-celled, 2-valved nut. *Seed* solitary, *Embryo* curved, and folded, with little or no perisperm, and curved inferior radicle.

254. MILLINGTONIA SIMPLICIFOLIA Roxb.

Leaves alternate, simple, broad-lanceolar.

OBSERVATIONS.

A large tree, a native of *Silhet*, where it is called *Daunt-runggee* by the natives; the timber is used for various purposes. Flowers in February and March; seed ripe in July and August.

DESCRIPTION.

Leaves alternate, petioled, broad-lanceolar, and taper most toward the base, entire, very remotely subserrate, rather acuminate,

* Having found it necessary to deprive our countryman, the late Sir Thomas Millington's memory of the genus assigned thereunto by the younger Linnæus (*Suppl. p.* 45, *and* 291) because on finding the ripe seed vessel of the only species thereof, it proves, as I long suspected, to be a real *Bignonia*; I have restored that respectable name to the system, under a different dress, by giving it to the two trees, at present, constituting this strongly marked family, which, I am inclined to think, has not, until now, been described.

smooth, veins simple, and parallel; 6-12 inches long, by 3-4 broad.

Panicles terminal, large oblong, rather open; composed of many, alternate, decompound, long, patent, brown-villous branches

Flowers numerous, sessile, very minute yellow.

Bractes oblong, clothed with ferruginous pubescence.

Calyx 3-leaved, (independent of two or three minute villous bractes, like a calycle;) *leaflets* ovate, smooth, permanent.

Petals 3, broad-ovate, waved, twice the length of the calyx, permanent.

Nectary: a variously lobed, smooth scale from the base of each petal on the inside; they form a *dome* over the pistillum; and round the base of the germ is found a flat, 3-angular body, with its angles bidentate.

Filaments 2, opposite, incurved, inserted without the interior, triangular nectary, bifid. *Inner* lamina supports on its apex a patelliform receptacle, on which the two-lobed yellow *anther* rests. *Exterior* lamina bifid; *segments* subulate and rise rather higher than the anthers.

Germ superior, two-celled, with 2 *ovula* in each, attached to the thickened middle of the partition. *Style* single, short. *Stigma* obscurely two-lobed.

Drupe size of a pea, nearly round, succulent, smooth, black, one-celled.

Nut conform to the drupe, rarely more than one-celled, hard; cell somewhat angular; the second or abortive cell always traceable.

Seed solitary, concave on the side next the abortive cell of the nut, hemispheric on the other. *Integument* single, membranaceous:

Albumen none.

Embryo curved, and doubled, as in the *Convolvulaceæ*, with curved inferior *radicle*.

EXPLANATION OF THE FIGURES.

Fig. 1. The end of a branchlet in flower; natural size.
2. Back and front views of a flower.
3. One of the petals with its nectarial scale separated.
4. Interior and exterior views of the stamina separated, and their anthers also removed, the better to show their receptacles, and the two-horned exterior lamina of the filaments.
5. The interior triangular nectary and calyx.
6. Sections of the germ; all, except 1st, much magnified.
7. The drupe; natural size.
8. Vertical section of the nut; much magnified.

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255 and 256. CORYPHEA TALIERA R.

Fronds subrotund, palmate-pinnatified, plaited. *Segments* forty pair; margins of the channel of the stipes armed. *Inflorescence* pyramidal, length of the trunk of the tree. *Spadix* from the centre of the leaves.

Tali, its Sanscrit name.
Tālier, of the Bengalese.
Tarra, or Tahreet, of the Hindoos.

OBSERVATIONS.

This elegant, stately palm, is a native of *Bengal*, though scarce in the vicinity of Calcutta. Flowering time the beginning of the hot season; seed ripens about nine or ten months thereafter.

DESCRIPTION.

Trunk perfectly straight, about thirty feet high, and, as near as the eye can judge, equally thick throughout, of a dark brown colour, and somewhat rough with the marks left by the impression of the fallen leaves.

Fronds palmate, pinnatified, plaited, subrotund. *Leaflets*, or divisions of the frond, united rather more than half way, numerous, (generally from 80 to 100) linear, lanceolate, pointed until broken by the wind, or otherwise; polished on both sides; a strong, somewhat four-sided nerve runs their whole length; general length about six feet, greatest breadth about four inches. The thread which forms part of the Linnæan specific character of *Corypha umbraculifera*, is sometimes present, sometimes wanting; at best, such perishable marks deserve no notice.

Stipes from five to ten feet long, remarkably strong: upper side deeply channelled, with the sharp margins thereof armed with numerous, short, strong, dark-coloured, polished, compressed spines.

Spathes just as numerous as the primary and secondary ramifications in the spadix, all are smooth, and obtuse.

Spadix superdecompound, issuing, in the month of February, from the apex of the tree, and centre of the fronds, forming an immense, diffuse, ovate *panicle*, of about twenty or more feet in height, so that the height of the whole tree from the ground to the top of the spadix, is now about fifty feet.

Primary branches alternate, round, spreading, nearly horizontal, with their apices ascending.

Secondary ramifications alternate, bifarious, compressed, drooping, recurved, soon dividing into numerous, variously curved, smaller, subcylindric branchlets, covered with innumerable, small, white, odorous, subsessile flowers.

Calyx beneath, minute, obscurely 3-toothed.

Corol. *Petals* three, oblong, concave, fleshy, smooth, expanding, many times larger than the calyx. No nectary.

Stem. *Filaments* six, nearly of the length of the petals, at the base broad, and in some measure united. *Anthers* ovate.

Pistil. *Germ* above, 3-lobed with the embryo of a distinct seed in each. *Style* shorter than the stamina. *Stigma* simple.

Drupes from one to three, conjoined, though one is by far the most common, and then the rudiments of the other two are present; they are, singly, quite round, about the size of a crab-apple; when ripe wrinkled, and of a dark olive, or greenish yellow colour. The pulp is but in small proportion, and yellow when the fruit is ripe.

Seed solitary, round, attached to the base of the drupe, of a white colour and uniform horny substance, with a small cavity in the centre.

Embryo lodged in the very apex; this circumstance alone is sufficient to distinguish it from Gærtner's *Corypha umbraculifera*.

OBSERVATIONS.

The leaves of this tree are employed by the natives to write on with their pointed steel bodkins, and are also split to tie the rafters of their houses together, for they are found to be strong and durable.

Except when in flower, or seed, this tree is scarcely to be distinguished from *Borassus flabelliformis*, or Tāl of the Bengalese.

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257. TACCA INTEGRIFOLIA.

Leaves oblong, entire ; petioles and scapes scabrous.
Tacca integrifolia. *Bot. Magaz.* 1488.

OBSERVATIONS.

Found by Mr. I. R. indigenous in the valleys amongst the hills behind *Islamabad*, *Chittagong*. From thence it has been introduced into the Botanic Garden at *Calcutta*, where it blossoms during the hot and rainy season : and the seed ripens in three and four months after.

DESCRIPTION.

Root an oblong curved tuber, of a middling size, with wiry fibres from its sides ; inward colour pale yellow ; perennial.

Stem none, or very trifling.

Leaves radical, petioled, recurvate, oblong, entire, acuminate, smooth, strongly marked with parallel veins, and somewhat bullate ; 8-16 inches long, by 4-8 broad.

Petioles shorter than the leaves, sheathing at the base, and above that a groove down the inside, the whole considerably rough with small visible sharp points.

Scapes axillary, solitary, about as long as the petioles, and rough like them, cylindric, direction from erect to diverging, and often variously bent.

Involucre 4-leaved, besides many filiform filaments which are mixed amongst the pedicels. *Exterior* two (leaves of the involucre) stem-clasping, reflexed, broad-ovate-lanceolate, finely acuminate, many-nerved, from two to three inches long, by 1½ broad. *Interior* pair greatly longer, broad-petioled, ascending in form of a vault over the flowers, oval-ventricose, many nerved, smooth and coloured ; length, petioles included, about 5 inches, by 3 broad.

Flowers 4-8, long-pedicelled, large, at first nearly erect, but on the second day of expansion drooping, colour a mixture of greenish purple and yellow ; about the same number of very long, filiform, smooth, pendulous bodies are found interspersed among the pedicels.

Calyx superior, one-leaved, base cup-shaped ; *border* consists of six large coloured segments ; *exterior* 3 rather narrower, more pointed, and less deeply coloured : *inner* three oblong, obtuse, or emarginate ; soon after expansion they become completely reflex.

Corol no other than the segments of the border of the calyx, which resembles one very much.

Filaments (petals of Forster) 6, inserted about the middle of the tube of the calyx, they resemble little conic vaults. *Anthers* on the inside of the interior *wall* of the vaults.

Germ inferior, clavate, 6-ribbed, one-celled, and contains numerous *ovula*, attached to three, bifid, parietal receptacles.

Style short. *Stigma* 3-lobed ; *Lobes* large, coloured, and emarginate on the exterior edge.

Berry oblong, fleshy, an inch and a half in length, by one broad, six-sharp-ribbed, crowned with three semilunar marks, the remains of part of the calyx, one-celled.

Seeds numerous, attached to three divided parietal receptacles, reniform, ribbed. *Integument* single, tough, dark-brown.

AMOORA.*

HEXANDRIA MONOGYNIA.

NATURAL ORDER MELIACEÆ. Juss.

GENERIC CHARACTER.

Calyx three, or five-parted. *Petals* three. *Nectary* globular, with the sessile anthers attached to its inside. *Capsule* superior, 3-celled, 3-valved. *Seeds* solitary, arilled.

258. AMOORA CUCULLATA.

Polygamous. *Leaves* unequally pinnate ; *leaflets* opposite 2-4 pair, obtuse. *Hermaphrodite Peduncles* axillary, few-flowered ; *male* panicled.

Amor, or Amoor of the Bengalese.

OBSERVATIONS.

A tree of a considerable size, but of very slow growth, a native of the Delta of the *Ganges*. Flowering time the latter part of the rainy, and beginning of the cold season.

DESCRIPTION.

Trunk in young trees straight, with few *branches* : the *bark* ash coloured, and smooth : *young shoots* also smooth.

Leaves alternate, unequally pinnate, from 6 to 18 inches long. Leaflets opposite, two, three, or four pair, short-petioled, obliquely-ovate-lanceolate, obtuse, unequally divided by the nerve, polished on both sides, and of a firm texture ; margins entire, from three to six inches long. The terminal leaflet is often cowled at the base, as represented in the drawing at a, hence the specific name.

Petioles nearly round, and pretty smooth.

Stipules none.

MALE TREE.

Panicles axillary, solitary, drooping about as long as the leaves ; ramifications numerous, diverging.

Flowers numerous, small, yellow.

Bractes a small obscure scale, under each division of the panicle ; and two press the calyx laterally.

Calyx small, one-leaved, 3-toothed. The two bractes while they remain, make it appear 5-parted.

Petals three, oval, concave, pressed to the nectary.

Nectary round-turbinate, with contracted triangular opening on the apex.

* This genus, belonging to the natural order *Meliaceæ*, seems allied to *Cupania*, and *Guarea*, from which it may be readily known by the shape of the nectary, as well as the number of petals and stamina.

Filaments none. *Anthers* from six to eight, sessile, round the inside of the nectary, and they seem abortive.
Germ none, but a clavate gland in its place.

HERMAPHRODITE TREE.

Peduncles axillary, solitary, from 3 to 6-flowered.
Flowers larger than the male, in other respects the same.
Calyx, *corol*, and *nectary* as in the male *Anthers* always six.
Germ superior, 3-sided, ovate, covered with minute stellate scales, 3-celled, with two vertically placed *ovula* in each, attached to the middle of the axis. *Style* none. *Stigma* large, 3-lobed; *lobes* somewhat 2-lobed.
Capsule nearly round, as large as a middling-sized apple, 3-lobed, 3-celled, 3-valved. *Cortex* thick, firm, and of a tough, fleshy texture.
Seeds solitary, of a roundish-trigonal shape, three-fourths covered with a fleshy bright orange-coloured *aril*. *Integument* under the aril smooth, and of a chestnut colour.
Albumen none.
Embryo inverse. *Cotyledons* conform to the seed. *Plumula* 2-lobed.
Radicle semilunar, superior.

259. PODALYRIA BRACTEATA.

Shrubby. *Leaves* simple, oval. *Peduncles* axillary, once or twice bifid, ultimate divisions one-flowered, with a pair of large opposite roundish, many-nerved bractes hiding the calyx, and a similar pair at the forks of the peduncles.
Goopree the vernacular name in the *Silhet* district, where it is found indigenous in the forests: growing to the size of a large bushy shrub. Flowering in May and June; and the seed ripen in December and January.

DESCRIPTION.

Tender shoots columnar, and clothed with a few thinly scattered hairs.
Leaves alternate, bifarious, petioled, oval, entire, obtuse, smooth, and beautifully reticulate with slender veins: length 3-6 inches, by 2-4 broad.
Petioles from half an inch, to an inch and a half long, a little hairy.
Stipules ovate, many-nerved.
Peduncles axillary, solitary, once, or twice-bifid, each ultimate division one-flowered.
Bractes in pairs at the divisions of the peduncles, and one pair, the largest, embrace each flower; all are round, or oval, and many-nerved.
Flowers large, white, perfectly papilionaceous.
Calyx bowl-shaped, hairy on the outside; *mouth* unequally 5-toothed: caducous.
Banner very broad, deeply emarginate, short-clawed. *Wings* falcate, obtuse, fine-clawed, length of the banner. *Keel* 2-petalled, but their lower margins united, length and shape of the wings.
Filaments 10, distinct to their insertion on the receptacle round the base of the germ, subulate, smooth, nearly as long as the pistillum, ascending in a gentle curve. *Anthers* ovate-oblong, erect.
Germ lanceolate, smooth, one-celled, containing 3 *ovula* attached to the upper margin. *Style* subulate. *Stigma* acute.
Legumes obliquely-oblong, taper equally at each end, apex acuminate, and somewhat recurved, one-celled, 2-valved, smooth, out-side dark-brown; within pretty smooth, and whitish: 3-4 inches long, by one inch and a-half broad.
Seeds two or three, large, and very unequal, colour a dark brown.
Albumen none.
Embryo as in other *Leguminosæ*.

HEYNEA.

DECANDRIA MONOGYNIA.

NATURAL ORDER, MELIACEÆ. Juss.

GENERIC CHARACTER.

Calyx 5-toothed. *Petals* five. *Nectary* cylindric, with the anthers attached round the inside of its mouth. *Germ* superior, 2-celled, with two ovula in each cell. *Capsule* one-celled, 2-valved, one-seeded. *Seed* arilled. *Embryo* inverse, without *albumen*.

260. HEYNEA TRIJUGA.

Leaves unequally pinnate; leaflets three pair. *Panicles* axillary, long-peduncled.
Heynia trijuga. *Bot. magaz.* 1738.
Yeacushi, of the Nepaulese.

OBSERVATIONS.

A native of *Nepaul*; from thence, in 1802, Dr. Buchanan sent seeds of this tree to the Botanic Garden at *Calcutta* under the vernacular name *Yeacushi*, where in seven years, the young trees were about fifteen and twenty feet high; with much the habit of the *walnut tree*.. Flowering time, in the Botanic Garden, March; seed ripe in October.

DESCRIPTION.

Trunk straight, in our young trees of six years growth thick as a man's thigh. *Bark* dark ash-coloured, and pretty smooth. *Branches* few; *young shoots* marked with scabrous spots.
Leaves unequally pinnate, alternate, from one to two feet long. *Leaflets* opposite, short-petioled, two or three pair, ovate-oblong, acuminate, entire, smooth, length from four to eight inches; and from two to four broad.
Petioles round, smooth, swelled at the insertion of the leaflets. *Petiolets* channelled, less than an inch long.
Stipules none.
Panicles axillary, solitary, long-peduncled, smooth, erect.
Flowers numerous, small, white.
Bractes minute, caducous.
Calyx one-leaved 5-toothed, permanent.
Petals five, cuneate-lanceolate, spreading.

Nectarium sub-cylindric, shorter than the petals, half ten-cleft ; *divisions* alternately a little shorter, and bifid.

Filaments scarce any. *Anthers* 10, ovate, 3-lobed, crowned with an obtuse point, attached to the inside of the divisions of the nectary.

Germ superior, immersed in a large fleshy ring, two-celled, with two *ovula* in each cell, attached to the middle of the partition. *Style* short. *Stigma* large, nearly round, with two-toothed apex, which is rather within the mouth of the nectary.

Capsule round, size of a small cherry, fleshy, one-celled, two-valved, opening round the apex.

Seed solitary, round, invested in a complete, thin, white, scabrous aril, which with the seed, as in the germ, is attached to what was the partition, now pressed to one side by the abortion of three-fourths of its original contents. *Integument* single, when recent orange, but soon changes to a chestnut colour, smooth and spongy ; a long white umbilicus, strongly marked on the side of attachment.

Albumen none.

Embryo inverse. *Cotyledons* two, (hemispheric,) conform to the seed, firm, green. *Plumula* small, two-lobed. *Radicle* superior, small.

OBSERVATIONS.

The bark, leaves, and tender parts possess a considerable share of a peculiar bitter taste ; and the cold infusions thereof, on the addition of a little sulphate of iron, became black, two principles very generally found amongst the plants of this natural order, which grow in *India*.

261. SANDORICUM INDICUM.

Leaves ternate ; *panicles* axillary.

S. indicum. *Linn. spec. plant. edit. Will.* 2. *p.* 556.

Sandoricum *Rumph. amb.* 1. *s.* 177. *t.* 64.

OBSERVATIONS.

This elegant tree, a native of the *Molucca Islands*, was introduced into the Botanic Garden at Calcutta, by the late Colonel Kyd, about fifteen years ago: the largest is now about thirty feet high, with a perfectly straight trunk ; smooth greenish coloured bark, and a very large, almost round, very ramous, ever-green head. Flowering time in Bengal the month of February.

DESCRIPTION.

Leaves alternate, petioled, ternate, about a foot long.

Leaflets ovate, entire ; upper side smooth except when young ; downy underneath, from five to seven inches long, and three or four broad.

Petioles round, when young downy.

Stipules none.

Panicles axillary, diffuse, often longer than the leaves, and drooping.

Bractes oblong.

Flowers numerous, small, yellow.

Calyx beneath, campanulate, five-parted ; divisions rounded, downy.

Corol : Petals 5, linear-oblong, obliquely emarginate, expanding.

Nectary double ; the *exterior* cylindric, with mouth 10-toothed ; *interior* about one-fourth the length of the exterior, enveloping the germ, and base of the style, mouth ten-toothed.

Filaments none. *Anthers* ten, affixed to the inside of the mouth of the exterior nectary.

Stigma large, five-parted.

Berry globular, size of a small orange, somewhat 5-sided, a little downy, when ripe of a dull yellow colour ; pulp firm, in large quantity, white, and acid.

Seeds from one to five come to maturity, reniform, immersed in a soft white pulp, which adheres firmly to the hard exterior white integument of the seed ; under which there is a second, firm, brown coat.

OBSERVATIONS.

The fruit abounds in a firm, fleshy, agreeable, acid pulp, which forms a covering of nearly half an inch in thickness round the white gelatinous pulp in which the seeds are lodged ; these two sorts of pulps are separated by a slender, brownish integument.

BUCHANANIA.

DECANDRIA MONOGYNIA.

GENERIC CHARACTER.

Calyx 5-toothed. *Petals* 5. *Nectary* double ; the *exterior* a crenulate cup between the filaments and germ ; the *inner* 4 subulate bodies on one side within the former. *Germ* superior, one-celled, one-seeded ; attachment from the bottom of the cell to the apex of the ovule. *Drupe* with a one-seeded nut. *Embryo* transverse, no albumen.

262. BUCHANANIA ANGUSTIFOLIA.

Arboreous. *Leaves* linear-oblong, emarginate. *Panicles* terminal.

OBSERVATIONS.

A small, slow growing tree, a native of the southern part of the peninsula of *India*, from thence introduced, by Dr. Francis Buchanan, into the Botanic Garden at *Calcutta* in 1802. In 1808 the largest of the young trees blossomed in May and June ; and the fruit take nearly one year to come to maturity.

DESCRIPTION.

Trunk (of our young trees) straight, 12-15 inches in circumference, 4 feet from the ground, *Bark* very smooth and ash-coloured.

Branches numerous spreading, and abounding in branchlets and foliage ; general-height of the trees 20-25 feet.

Leaves alternate, approximate, petioled, linear-oblong, entire, obtuse, or emarginate ; of a firm texture, and smooth on both sides ; length from three to six inches, and from 1 to $2\frac{1}{2}$ broad.

Petioles round, smooth, about an inch long.

Stipules scarce any.

Panicles terminal, and from the exterior axils, smooth.

Flowers numerous, small, white.

Bractes at the divisions of the panicle, very small.

Calyx five-toothed, greatly shorter than the corol.

Petals five, long-ovate, spreading ; margins recurvate.

Nectary double, as in *B. latifolia*. *Exterior* a thick crenulate cup

round the lower half of the germ, with ten grooves on the outside, corresponding with the filaments. *Inner* 3, 4, or 5 subulate bodies, like *abortive germs*, embrace one side of the real *germ*, within the *exterior nectary*.

Filaments ten, inserted round the base of the exterior nectary, shorter than the petals. *Anthers* ovate, small.

Germ superior, ovate, one-celled, and contains a single ovule, attached by a long curved cord to the bottom of the cell (base and vertex). *Style* short. *Stigma* simple.

Drupes nearly round, sides a little flattened, size of a gooseberry, smooth, when ripe yellow, and succulent. *Nut* obliquely, and transversely oval, one-celled; when germination begins it falls into two equal, black, thick, very hard valves.

Seed single, conform to the nut.

Albumen none.

Embryo subinverse. *Cotyledons* two, equal. *Radicle* conic, marginal, pointing up to the vertex of the seed, in fact superior.

263. INOCARPUS EDULIS.

Linn. suppl. 239.

Gajanus. *Rumph. Amb.* 1. *p.* 170. *t.* 65.

OBSERVATIONS.

A native of the *Molucca* Islands, and from thence introduced into the Botanic Garden at *Calcutta*, in 1798, where in ten years, the largest of them were about 25 and 30 feet high; blossom during the hot season; and ripen their fruit in August and September.

DESCRIPTION.

Trunk straight. *Bark* smooth, greenish ash-colour. *Branches* spreading, with numerous, bifarious, flexuose, beautifully drooping branchlets.

Leaves alternate, bifarious, short-petioled, permanent, oblong, emarginate, entire, both sides polished, and of a deep shining green colour; length from 6 to 12 inches, and about 3 or 4 broad.

Stipules minute, caducous.

Spikes axillary, sessile, solitary or in pairs, greatly shorter than the leaves: in our *Bengal* plants smooth.

Flowers numerous, small, very pale yellow, fragrant.

Calyx bilabiate.

Corol funnel-shaped. *Border* 5-cleft; *segments* lanceolate.

Filaments ten, in a double series, hid in the tube, and inserted into it. *Anthers* oval, those of the upper series even with the mouth of the tube of the corol.

Germ superior, oval, one-celled, containing one *ovule* attached to the top of the cell, immediately under the stigma, for there is no style.

Drupe obliquely-oval, size of a goose's egg, a little compressed laterally, smooth, when ripe yellow, and of a tough, fibrous texture, one-celled, two-valved, opening round the margin into two equal portions.

Nut solitary, thick, 2-valved, one-celled, and of a hard, tough fibrous consistence.

Seed single, conform to the nut, and attached to it immediately under the stigma. *Integuments* two; the *exterior* brown, firmer, thicker, and beautifully marked with numerous, ramous veins; *inner* membranaceous.

Albumen none.

Embryo inverse. *Cotyledons* two, conform to the seed, amygdaline. *Plumula* in seeds beginning to vegetate consists of several, imbricate scales, as in the figure. *Radicle* superior, cylindric, and lodged immediately within the umbilicus, under the stigma.

OBSERVATIONS.

The rapid growth of this very beautiful, ever-green tree, the elegant shape of its spreading, dense crown; and deep green foliage, renders it one of the most ornamental presents *Bengal* has got from the *Molucca* Islands. The kernel is certainly edible, but by no means palatable. As yet I can say nothing of the quality of the timber.

BERRIA.*

POLYANDRIA MONOGYNIA.

GENERIC CHARACTER.

Calyx 5-parted. *Corol* 5-petalled. *Germ* superior, 3-celled; cells many-seeded: attachment interior. *Capsule* 3-valved, 3-celled, 6-winged. *Seeds* a few in each cell. *Embryo* inverse, and furnished with albumen.

264. BERRIA AMMONILLA.

Ammonilla, of the Cingalese.
Trincomally wood tree of the English.

OBSERVATIONS.

A native of *Ceylon*, and one of their largest, and most useful timber trees; much of the wood is annually exported from Trincomally to the coast of Coromandel; hence the English name, *Trincomally wood*. Some young trees in the Botanic Garden at *Calcutta* have straight trunks, covered with smooth dark brown bark.

DESCRIPTION.

Leaves scattered, petioled, cordate, sometimes slightly scalloped, 5 or 7-nerved, acute, smooth on both sides, length from 4 to 8 inches.

Petioles rather shorter than the leaves, slender, round, smooth, and coloured.

Stipules ensiform.

Panicles terminal, and from the exterior axils, large, very ramous, bearing numerous, small, yellow flowers.

Calyx one-leaved; outside downy, splitting irregularly into three, four, or five segments; permanent.

Corol. *Petals* five, spreading obliquely-oblong, double the length of the calyx, or more.

* Named after Dr. Andrew Berry, of Madras; an eminent physician and botanist, to whose abilities, and industry, the Botanic Garden at Calcutta is much indebted.

It appears to belong to Jussieu's natural order Malvaceæ; and the circumstance of the filaments being in some degree united at the base, as well as the habit of the plant, might justify its being considered monadelphous.

Stem. *Filaments* numerous, half the length of the petals, slightly united at the base. *Anthers* incumbent, 2-lobed.

Pistil. *Germ* above, hairy, ovate. *Style* short. *Stigma* 3-cleft.

Capsule (6-winged,) round, 3-celled, 3-valved, opening from the apex; each valve ornamented with two, large, oblong, membranaceous, reticulated, expanding, villous wings.

Seeds from one to four in each cell, irregularly ovate, clothed with much stiff, light brown, short hair, and affixed to the central receptacle near its apex.

BROWNLOWIA.*

POLYANDRIA MONOGYNIA.

NATURAL ORDER, MALVACEÆ Juss.

GENERIC CHARACTER.

Calyx simple, 5-parted. *Corol* 5-petalled. *Nectary* 5-leaved, between the numerous *stamina* and *germ*. *Style* and *Stigma* simple. *Capsules* (from one to five,) one-celled, 2-valved. *Seeds* one or two. *Embryo* erect, without *albumen*.

265. BROWNLOWIA ELATA.

OBSERVATIONS.

Maws-jaat, the vernacular name in *Chittagong*, where the tree is indigenous, and grows to a very great size, particularly in the back part of that province. Flowering time the month of May, and the seed ripen in October.

DESCRIPTION.

Trunk straight, and of great size; that of full grown trees in their native soil about fifteen feet in circumference, four feet above the root. *Branches* numerous, spreading, forming a very large, ovate, shady head. *Bark* of the trunk and large branches ash-coloured and smooth, of the young parts clothed with a little hoary pubescence.

Leaves alternate, petioled, 3-7-nerved cordate, margins entire, one of the lobes (into which the base is divided) generally larger than the other, upper surface smooth, hoary underneath; from 4 to 12 inches long, and the breadth from 3 to 8.

Petioles swelled at each end, the rest round, and a little hoary; about one-third, or one-fourth the length of the leaves.

Panicles terminal, large, ovate, very ramous; with the ramifications rather hoary.

Flowers numerous, pedicelled, collected in little fascicules; colour bright yellow, not fragrant, but pretty large and showy.

Calyx inferior, one-leaved, campanulate; *border* 4 or 5-toothed, hoary on the outside, smooth within.

Corol: Petals five, in the bud contorted, when expanded obliquely-oblong, yellow, spreading.

Nectary or abortive filaments 5, linear, shorter than the stamina,

* This truly majestic tree constitutes a new genus, which is dedicated to the memory of the late Lady Brownlow, daughter of Lady Amelia Hume, by whose premature decease botany has lost one of her best and most powerful patronesses.

and stand *between* them and the germ, opposite to its five grooves.

Filaments numerous, slender, shorter than the petals, most slightly or rather scarce united at the base, and inserted round the apex of a short turbinate receptacle.

Germ superior, and elevated on the turbinate receptacle considerably above the insertion of the calyx and corol, very hairy, conspicuously and deeply 5-lobed, 5-celled; each containing two *ovules* attached by their middle to the inner angle of the cell. *Style* single, 5-furrowed, length of the filaments. *Stigma* simple.

Capsules from 1 to 5; 2 or 3 most frequent, round-oval, about an inch and a half in diameter, and one inch thick, of a firm, fibrous, woody texture; surface grey, or ash-coloured, and somewhat downy, one-celled, 2-valved.

Seed one, rarely two; conform to the capsule. *Integuments* two; *exterior* light brown, and friable; *interior* membranaceous.

Albumen none.

Embryo conform to the seed, erect. *Cotyledons* two, nearly equal, amygdaline. *Plumula* small, villous, 2-lobed. *Radicle* oblong, inferior.

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266. MAGNOLIA PTEROCARPA.

Leaves oblong, with tapering base, entire. *Flowers* terminal, solitary. *Calyx* of several deciduous spathes. *Corol* 9-petalled, (the exterior green on the outside.)

Doolee Champa the vernacular name in *Silhet*.

OBSERVATIONS.

A middling sized, very ramous tree, a native of the hilly countries in the vicinity of *Silhet* and *Chittagong*, where it blossoms in April and May, and perfumes the air to a considerable distance with the fragrance of its fine large flowers; seed ripen in October and November.

DESCRIPTION.

Young Shoots strongly marked with the annular marks left by the stipules, otherwise smooth.

Leaves alternate, oblong, taper most to the base, entire, hard, and void of pubescence, but glaucous, particularly underneath, obtuse, ribbed with large, simple, expanding veins, and between them the small ones are beautifully reticulate; length 6-18 inches, by 3-9 broad.

Stipules solitary, sheathing, attached on one side to the edges of the petioles of the next inferior leaf.

Flowers terminal, solitary, large, as in Miller's figure of *Magnolia grandiflora*, and like them, white and fragrant.

Calyx, what I consider to be it, or an *involucre*, are the many spathes which cover the flower bud, and drop off in succession as it swells, leaving strong, annular marks behind.

Petals nine, oval, thick, firm and fleshy, with thin waved edges; the exterior 3 or 4 green on the outside, all the rest white.

Stamina numerous, imbricated, linear, incurved; on each side a polliniferous groove, to within a very little of the base.

Germs numerous, imbricated upward into a cone; base swelled, one-celled, and contains two *ovules*, attached to the inner angle, or side of the cell; upper part (*Style*) free, ensiform, and villous. *Stigma* simple.

Fruit an oblong strobiliform cone, of about six inches in length, and 7-8 in circumference, upwardly imbricated with numerous, long-tailed follicular samaræ, which open on the outside near the base, and expose to view the large beautiful orange seeds, often hanging by a slender, soft, sericeous filament.

Seeds one, or two, subtriangular; angles rounded. *Integuments* three; *exterior* fleshy, and while fresh of a fine glossy orange colour; *second* of a nuciform texture, and divides into two valves, when vegetation begins; *inner* a fine membrane.

Albumen conform to the seed, soft and oily.

Embryo small, lodged in that angle of the albumen, next the umbilicus. *Cotyledons* cordate. *Radicle* oval, centripetal.

267. LEPIDAGATHIS CRISTATA.

Linn. sp. pl. ed. Willd. 3. *p.* 400.

Perennial, diffuse. *Leaves* opposite, sessile, lanceolate. *Inflorescence* a dense head close to the crown of the root.

OBSERVATIONS.

A native of elevated, dry, barren ground over the Coast of *Coromandel*. Flowering time the rainy and cold season.

In generic character it is but little removed from *Barleria*, but the habit of the plant is very different.

DESCRIPTION.

Root perennial.

Stem scarce any, but several, long, slender, opposite, diffuse, 4-sided, ramous, smooth branches spread close on the ground, and often strike root.

Leaves opposite, sessile, lanceolate entire, sometimes villous, or even hairy and scabrous; from one to three inches long, and half-an-inch or less broad.

Inflorescence in large, variously-shaped, densely imbricated heads, close to the earth, near the root, with smaller ones scattered over the joints of the larger branches.

Bractes numerous, imbricated, lanceolate, ciliate, spinous pointed.

Flowers numerous, small, rose colour.

Calyx of two pair of unequal leaflets, *exterior pair* greatly larger, with the lower leaflet thereof bidentate; all are hairy and ciliate.

Corol one-petalled, ringent. *Tube* gibbous, with *mouth* much contracted. *Throat* campanulate; *upper lip* erect, emarginate; *under lip*, large, 3-parted, middle division broad, emarginate, a little curled, and more deeply coloured.

Filaments within the throat of the corol. *Anthers* twin.

Germ ovate, elevated on a glandular receptacle. *Style* sufficiently long to elevate the small *stigma* even with the anthers.

Capsule ovate, acute, sessile, 2-celled, 2-valved, bursting with elasticity, as in *Justicia*, *Barleria*, &c.

PISTIA.

268. PISTIA STRATIOTES.

Linn. sp. pl. ed. Willd. 3, *p.* 690.

Zala asiatica. *Lour. cochinch. p.* 405.
Kodda-pail. *Rheed. mal.* 11. *p.* 63. *t.* 32.
Plantago aquatica. *Rumph. amb.* 6. *p.* 177. *t.* 74. *fig.* 2.
Cumbhica, the Sanscrit name.
Nuroo-boodooky of the Telingas.
Tacca-panna of the Bengalese, and Hindoos.

OBSERVATIONS.

Found swimming on pools of stagnant water over most parts of India, and has much the appearance of half-grown lettuce plants. Flowering time the hot season.

DESCRIPTION.

Root consists of numerous, long, tapering, hairy fibres, rarely entering the mud or earth.

Leaves radical, sessile, shape between obcordate and triangular, exterior margin scalloped; many elevated ridges run lengthways underneath; downy on both sides.

Gemmation, or *stoles* from the base of the united leaves.

Flowers short peduncled, rising from the centre of the leaves, few and in succession, small, pale yellow; the structure uncommon, and beautiful in the extreme.

Calyx none.

Corol one-petalled, tubular, irregular. *Tube* obliquely bell-shaped, woolly on the outside; a crescent-shaped, fleshy, yellow gland, (*lower nectary*) on the centre of the inside, opposite to the stigma. *Border* broad-cordate, woolly on the outside; margin a little waved; on its middle there is a green, fleshy, crenulated saucer-shaped body, (*upper nectary*,) from the centre of which rises the antheriferous column.

Stamina. *Filament* single, from the centre of the (upper) *nectary* of the border of the corol. *Anthers* five, adjoined to the enlarged apex of the short filament.

Pistil. *Germ* above, ovate. *Style* short, slightly curved towards the stamina. *Stigma* somewhat peltate.

Capsule ovate, beaked, one-celled.

Seeds a few, oval, rugose, affixed to a longitudinal receptacle on the inside of the base of the capsule, which, from its oblique situation, appears to be its back part.

Embryo obovate, lodged in the apex of an ample albumen.

EXPLANATION OF THE FIGURES.

Fig. 1. A plant, natural size.
2. An entire flower.
3. The same, with part of the bell-shaped tube of the corol cut, and thrown back, to show more of the germ.
4. A perpendicular section of the same. These last three much magnified.
5. The capsule in its natural recurved state; natural size.
6. A section of the same, with some of the seeds in it; magnified.

269. GOSSYPIUM HERBACEUM.

Bi-triennial, young parts hairy: *leaves* hairy, palmate, with sublanceolate, acute lobes: *leaflets of the exterior calyx* dentate: *capsules* ovate, pointed. *Seeds* distinct, clothed with firmly adhering white down, under the long white wool.

G. herbaceum. *Linn. spec. plant. edit. Willd.* 3. *p.* 803.
Gossipium Capas. *Rumph. Amb.* 4. *p.* 33. *t.* 12.
Cudu pariti. *Rheed. mal.* 1. *p.* 55. *t.* 31.
Karpassi, or Kapossi, in Sanscrit.
Rewey, of the Hindoos.
Karri-Kapass, of the Bengalese.
Kootn, of the Arabians.
Poombeh, or Pembeh, of the Persians.
Patti-tshittoo, of the Telingas, and Patti the cotton itself.

OBSERVATIONS.

This, and its varieties, are by far the most universally cultivated by the natives of India.

DESCRIPTION.

Trunk short, nearly straight, woody, often lasting three or even four years; bark ash-coloured, or brown, and by age becomes cracked in various directions. *Branches* numerous, with their tender extremities well clothed with long, soft, diverging hairs, and marked with numerous rust-coloured dots; general height, when cultivated on a middling soil, about three feet, though in a rich garden loam they rise to eight or even ten feet.

Leaves alternate, petioled, hairy on both sides, palmate; *lobes* from three to five, in young plants lanceolate, in old almost ovate; size very various; colour pale green: glands, in large luxuriant leaves there is generally a single one near the base of each of the three middle, or large nerves; but I do not think they ever can be so much depended on, as to form a part of the specific character in this, or any other of the species.

Petioles hairy, nearly as long as the leaves.

Stipules obliquely linear-lanceolate.

Peduncles solitary, short, hairy, opposite to the leaves, or on one side of them.

Flowers solitary, large, pale yellow, with the bottom of the bell of a dark crimson colour.

Calyx: exterior, leaflets sometimes nearly entire, sometimes acutely dentate, or even gashed, hairy, with a gland on the base of each: *inner* obscurely 5-toothed.

Corol large, campanulate.

Stamens numerous.

Stigma clavate, 3 or 4-ribbed, and spiral.

Capsule ovate, pointed, 3 or 4-celled.

Seeds a few in each cell, distinct, clothed with much, firmly-adhering, whitish-grey down, under the long white wool, or cotton.

OBSERVATIONS.

Of this species there are an infinite number of varieties, from soil, situation, method of culture, &c. I shall make a few remarks on as many of these as I have been able to rear under my own eye.

I. Dacca Cotton (the sort figured) may be reckoned the first variety, or deviation from the last mentioned common sort (G. herbaceum) in general cultivation over Bengal, and Coromandel. It is reared about Dacca (in Bengal), and furnishes that exceeding fine cotton wool, employed in manufacturing the very delicate, beautiful muslins of that country. It differs from the common (G. herbaceum) in the following respects:

1st. In the plant being more erect, with fewer branches, and the lobes of the leaves more pointed.
2d. In the whole plant being tinged of a reddish colour, even the petioles, and nerves of the leaves; and being less pubescent.
3d. In having the peduncles which support the flowers longer, and the exterior margins of the petals tinged with red.
4th. In the staple of the cotton being longer, much finer and softer.

These are the most obvious disagreements; but whether they will prove permanent I cannot at present say. The most intelligent manufacturers of that country, (Dacca,) think the great difference lies in the spinning, and allow little for the influence of soil.

II. Berar Cotton (of which there is no figure) I shall call the second variety. It is in general cultivation over the Berar country, and is from thence imported into the Circars, or northern provinces by Sada, Palawansa, &c. to Yerna goodum, in the Masulipatam district. With this cotton the fine Madras (more properly, Northern circar,) long cloth is made.

It differs from the above mentioned two sorts, in the following respects:

1st. In growing to a greater size; in being more permanent, (living longer), with smoother, and straighter branches.
2d. In having the leaflets of the exterior calyx more deeply divided, and the wool of a firmer, and more durable quality.

III. China Cotton (of which there is no figure,) I call the third variety. It has been lately introduced into Bengal from China, where it is cultivated, and its wool reckoned twenty-five per cent. better than that of Surat. It differs from the former sorts:

1st. In being infinitely smaller, with but very few, short, weak branches.
2d. In being (so far as my experience yet goes) annual.
3d. In having the leaflets of the exterior calyx entire, or nearly so.

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270. XANTHOCHYMUS DULCIS Roxb.

Polygamous. *Leaves* oblong. *Flowers* lateral, fascicled. *Corols* globular. *Fruit* oval, obtuse.

OBSERVATIONS.

A native of the *Molucca Islands;* from thence introduced into the Botanic Garden at *Calcutta*, as a species of *Mangosteen*. Flowering time, in *Bengal*, June, and July. Fruit ripe about the beginning of the cool season.

DESCRIPTION.

Trunk quite straight to the top of the tree. *Bark* smooth, olive-coloured. *Branches* and *branchlets* opposite, expanding, the latter grooved and keeled: height of trees, eight years old, about ten feet.

Leaves opposite, short-petioled, oblong, entire, often pointed; texture hard; both surfaces polished; length about six inches, and from two to three broad.

Petioles short, transversely wrinkled; at the base, on the inside a fleshy ligule, or protuberance, which is, I believe, common to the whole of this order *(Guttiferæ)*.

Stipules none.

Flowers in small fascicles from the axils of one or two years old branchlets, peduncled, of a middling size, nearly globular, greenish white, inodorous.

Calyx of four, five, or six unequal, round concave, permanent leaflets.

Petals five, round, sessile, concave, greatly larger than the calyx, and just as long as the stamina, contracted into a globe, with a small opening at the apex when most expanded.

Nectary in the *male*, a truncated, porous, yellow body, with five lobes projecting between the insertion of the five filaments. In the *hermaphrodite*, five, yellow, porous glands, alternate with the filaments, round the base of the germ.

Filaments in both five, incurved, broad, flat bodies, divided at the apex into six, seven or eight short portions, each of which supports a twin anther.

Germ in the *male* none; in the *hermaphrodite* ovate, smooth, 5-celled, with one *ovule* in each attached to the middle of the axis. *Style* scarce any. *Stigma* 5-lobed.

Berry size of an apple, from round to oval, obtuse, smooth, bright yellow when ripe, fleshy; *flesh*, or pulp in quantity, yellow, and rather sweet, one-celled; what formed the partitions in the germ, was the aril of the seed in its early stage.

Aril: a large portion of the pulp, of rather a softer consistence, somewhat darker colour, and pleasanter taste, appertains to each seed; which separates spontaneously, with its seed, from each other, and from the exterior, thick, fleshy covering, when the fruit is over ripe. This is the only edible part in the common *Mangosteen*, and some other species of *Garcinia*, and in this genus the most palatable part.

Seeds from one to five, oblong, rather pointed, at the base on the inside a large, oblong, lighter-coloured space, marks the attachment. *Integument* single, reticulated with lighter-coloured veins, on a dark cinnamon-coloured ground.

Albumen conform to the seed, of a hard, fleshy texture.

Embryo simple, very obscure until vegetation begins, soon after the seed is put in the ground, a small root issues from the lower end, and from the apex a scaly *plumula*, which soon sends forth from its base the permanent, quick growing root, while the small inferior one scarce increases in size; running between these, nearly through the centre of the seed, by nice dissection, and a good lens, the appearance of a slender cylindrical body may be traced. This I consider the real embryo, and if any one can be called simple, certainly this may. After vegetation has advanced a little, this mark becomes more conspicuous, as in the vertical section of the seed, which had been a month in the ground.

OBSERVATIONS.

Xanthochymus pictorius, and three species of *Garcinia*, which I have examined, have exactly the same conformation, and vegetate in the same manner. Are they not monocotyledonous?

The trees in the Botanic Garden are but small, being only eight years old, but very handsome, and the fruit palatable.

271. AERIDES MULTIFLORUM.

Parasitic, caulescent. *Leaves* bifariously imbricated, linear, emarginate, with hooked acumen. *Racemes* axillary, longer than the leaves, simple, or ramous. *Lip* with broad-cordate, entire lamina, and short obtuse horn, projecting under it. *Capsules* clavate, 3-sided.

OBSERVATIONS.

A large beautiful species, with many, long, closely imbricated, hard glossy leaves, and copious very long, suberect, often compound racemes, of numerous, pretty large, pale-rosy flowers: is found on trees, growing on the *Garrow* hills in the vicinity of *Silhet*, where, with most plants of the order, it blossoms during the months of April and May.

272. ARUM CAMPANULATUM.

Stemless. *Leaves* decompound. *Flowers* sessile with respect to the surface of the ground, and appear when the plant is destitute of leaves. *Spathe* length of the spadix, campanulate, with curled margins. No nectary. *Club* broad ovate-lobate. *Anthers* 2-celled.

Schena et Mulenschena. *Rheed Mal. vol. II. p.* 35. *et* 37. *t.* 18 *et* 19.

Tacca sativa. *Rumph. Amb.* 5. *p.* 324. *t.* 112. the root and leaf, and Tacca phalifera, *t.* 113. *f.* 2. the flower, at which period not a leaf is to be found.

Sanscrit. Canda, Kanda or Kulla.

Teling. Manchy-canda.

Beng. Wool.

OBSERVATIONS.

Found wild in damp places in the woods near *Calcutta;* flowering time the beginning of the rains.

DESCRIPTION.

Root perennial, tuberous, roundish, covered with a dark brown skin, frequently, when in a good soil, as large as a child's head. From various parts of the chief root there issue smaller tuberosities which are employed as offsets to cultivate the plant by.

Leaves radical, for the most part only one or two, thrice bifid, divisions outwardly pinnatified, segments obliquely-oblong, pointed, smooth, size, very unequal, the exterior being always greatly longer than the inferior; the whole leaf is from one to three feet each way.

Petioles round, tapering, clouded with darker-coloured green, pretty smooth, about as long as the leaves.

Spathes very large, leathery, campanulate, border-curled, smooth on both sides; outside near the base pale green; middle part deeper green; and towards the margin greenish purple,

inside towards the margin yellowish purple, middle pale yellow, bottom deep dotted purple; diameter of the mouth of the bell in large plants about a foot; perpendicular height nearly the same.

Spadix about as long as the spathe, the lower third, or pistilliferous part cylindrical, the middle part, or staminiferous portion, somewhat turbinated; the club (here a very improper name) or upper third part is of a very broad short-conical, or subglobular shape, and of a dark purple colour, variously lobate and wrinkled, like a dried truffle: in large plants this part is six inches in diameter and four in perpendicular height.

Filaments none. *Anthers* numerous, closely impacted round the turbinate or middle portion of the spadix, linear, two-celled, with two corresponding openings at the apex, where they discharge the dust or pollen; the immense quantity of which that is poured out from these openings and drops down on the pistils is really inconceivable.

Nectarial filaments none.

Germs numerous, roundish. *Styles* subulate, thick, coloured. *Stigmas* large, yellow, downy, 2-lobed.

Berries numerous, long, obovate, red, and covered with a considerable portion of pulp.

Seeds one or two in each berry.

OBSERVATIONS.

This species is much cultivated over the northern *Circars*, and highly esteemed for the wholesomeness and nourishing quality of the roots. It deserves to be called the *Telinga potatoe*. The usual time of cultivation is immediately after the first rains in June. A very rich loose soil suits it best, where the swelling of the roots meets with little obstruction, and where they draw the greatest nourishment, for which reason it requires to be very well and repeatedly ploughed. The small tuberosities that are found on the larger roots are what they employ for sets, and are planted in the manner potatoes are in England, and about the same distance from one another. In twelve months they are reckoned fit to be taken up for use. The larger roots will then weigh, if the soil has been good and the season favourable, from four to eight or more pounds each: they keep well if kept dry, and are by the natives employed in food, in the same manner as the common yam.

273. PHŒNIX ACAULIS.

Stemless. *Fronds* radical, pinnate; *leaflets* folded, ensiform, in sub-opposite fascicles, pointing many ways, the lower spinous.

OBSERVATIONS.

A native of *Bahar*. Flowering time in the Botanic Garden at *Calcutta* the cold season. Seed ripe in April and May.

DESCRIPTION.

Stem none in plants ten years old: at this age, when in flower, the whole body of the plant, including the inflorescence, but exclusive of the foliage, is of an ovate form, and not exceeding six or eight inches in height, from the surface of the ground, and is sketched in the annexed figure, at fig. 1, and only about one-fourth part of the natural size.

Leaves (*fronds*) pinnate, from two to six feet long. *Leaflets* in nearly opposite, rather remote fascicles; the superior folded, slender, ensiform, and about eighteen inches long; the lower small, straight, rigid, and end in very sharp spinous points.

Petioles (*stipes*,) near the base flat; toward the apex triangular, smooth.

MALE.

Spathes and *spadix* as in the *female*, hereafter described.

Flowers alternate, solitary, sessile, small, pale yellow.

Calyx one-leaved, triangular; *angles* or *lobes* acute, and unequal.

Corol 3-petalled; *petals* obliquely-lanceolate, acute, slightly united at the base.

Filaments six, very short, inserted into the base of the corol. *Anthers* linear, nearly as long as the petals.

Pistil none.

FEMALE.

Spathes universal axillary, solitary, one-valved, about six inches long, with their base rather below the surface of the earth, generally splitting into two portions, down the middle on each side.

Spadix ramous, composed of many, simple, short, erect, flexuose branches; all are smooth, and pale yellow.

Flowers alternate, solitary, sessile, in bractiform notches on the sides of the branches of the spadix.

Calyx cup-shaped, truncate, with three obscure points at equal distances on the margin.

Petals three, subrotund, thick and fleshy, concave, smooth.

Nectary a small 6-toothed cup, in which the germs sit.

Germs three, each one-celled, and contains a single ovule attached to the inside of the cell. *Styles* three, recurved, small, and short. *Stigmas* small.

Drupe oval, fleshy, smooth, bright red, size of a very small olive, one-celled.

Seed solitary, oblong, with a deep longitudinal groove on one side.

Embryo in the middle of the back, or convex side of the seed.

274. MYRISTICA AROMATICA.

Leaves oblong. *Male flowers*, several on simple and compound axillary racemes. *Female flowers* solitary. *Calyx* pitcher-shaped.

M. officinalis. *Linn. syst.* 493. *Suppl.* 265. *Gært. sem.* 1. *p.* 194. *t.* 41.

M. moschata. *Willd. sp. pl.* 4. *p.* 869. *Woodville's Medical Botany*, 363. *t.* 134.

Nux myristica. *Rumph. amb.* 2. *p.* 14. *t.* 4.

Ja-i-phul, or Jaephal, the Hindostanee and Bengalese name of the nutmeg, and Jawatri of the mace.

Jouz-bew-a, of the Persians and Arabians.

Jali-phalo, the Sanscrit name of the nutmeg, and Jali-patri the mace.

OBSERVATIONS.

A native of the *Molucca Islands;* (bearing male and female flowers on different trees, and by late information in some instances monoecious;) and there blossom and bear their fruit the whole year.

DESCRIPTION.

Trunk straight. *Bark* smooth, and of a greenish ash, or dirty olive

colour. *Branches* in regular equidistant verticils, nearly horizontal, with their extremities often drooping.

Leaves alternate, sub-bifarious, short-petioled, elliptic, entire, smooth on both sides, but paler underneath; when bruised faintly aromatic; length from three to six inches, and from one to two and a half broad.

MALE.

Racemes axillary, often 2-cleft near the apex, with divisions spreading.

Flowers numerous, on ascending, clavate, pedicels, nearly as long as the peduncles.

Bractes of the pedicels solitary, minute, one-flowered, caducous; of the flowers also solitary, but larger, fleshy, more permanent, and embrace two-thirds of the base of the calyx.

Calyx one-leaved, pitcher-shaped. *Mouth* 3-toothed.

Corol none.

Filament single, rising in the centre of the calyx, and nearly of the same length, thick, linear, oblong, and obtuse. *Anthers*, in general about nine pairs, linear, adjoined lengthways to the upper half of the filament, but their chief bond of connection appears to be at their lower extremities.

FEMALE flowers in general upon a separate tree.

Peduncles axillary, solitary, rather longer than the petioles, while in blossom ascending, one-flowered.

Bractes: that of the flower as in the male.

Calyx as in the male.

Corol none.

Germ above, oval. *Style* very short, composed of two coalesced portions, each crowned with a diverging obtuse *stigma*.

Drupe round, fleshy, size of a peach, and also somewhat downy, marked with a suture which passes between the styles, one-celled, when ripe two-partible, opening spontaneously from the apex.

Seed: Nut roundish-ovate, affixed to the base of the cell, covered with a yellow, multifid, coriaceous *aril* (*mace*) marked with furrows corresponding with the divisions of the aril, otherwise smooth; of a dark brown colour, and tolerably hard.

Nucleus (common nutmeg,) like the nut of a roundish-ovate shape, also furrowed, affixed by its apex, but the embryo is placed in the base, which consists of a small bifid point, lodged between two, variously convolute, fleshy-farinaceous, fragrant, and gratefully aromatic lobes.

EXPLANATION OF THE FIGURES.

Fig. 1. A sprig of the male tree in blossom. Natural size.

a. One of the male flowers, and its bracte ×.

b. The same laid open, to show the stamina.

c. A perpendicular section of the columnar filament.

d. A transverse section of the same, and its nine pair of anthers.

e. An anterior view of one pair of the anthers detached from the column.

f. A back view of the same.

g. A section of one of the lobes.

These seven are all magnified, particularly the last four.

Fig. 2. A sprig of the female tree, with flowers, and fruit in their various stages. Natural size.

h. One of the flowers magnified, and laid open, to show the pistil.

i. The ripe fruit opening, which exposes to view the mace, spread over the shell of the nutmeg.

k. Half of the mace is here thrown back, exposing the shell of the nutmeg to view.

l. The shell cut round, with the entire nutmeg resting in it.

m. A perpendicular section of the seed, or nutmeg, exposing the embryo, or rudiment of the future plant, lodged in its base.

n. The same embryo magnified; the point o becomes the root, and + the stem.

OBSERVATIONS.

It is now well known that the description of this plant in the Supplementum Plantarum of the younger Linnæus, taken from Sonnerat, is that of another species.

La Marck's description, so far, at least, as relates to the stamens and style, appears to me to have been taken from the flowers of some other species of Myristica, which he received from the Isle of France, for the true nutmeg. Consequently the sort they have been long cultivating there, with so much care, is not the real Banda nutmeg; which the Dutch so long, and so effectually monopolized. For I can scarce think it possible, that any botanist could consider the thick firmly consolidated filament of the male flower of the true nutmeg, to be composed of from six to twelve smaller partible filaments, joined in one bundle; nor are there the smallest rudiment of any smaller filaments, connecting the linear anthers to the column (filament) in the centre; nor are the anthers themselves united, scarce even the two lobes which compose the pair, as I have called them.

The foregoing description, and accompanying figures are taken from growing plants in the Honourable Company's Botanic Garden at *Calcutta*, and from numerous specimens (preserved in spirits and otherwise;) collected and sent from Great Banda, Banda-Neira, Pulo Ay, &c. Molucca Islands, since they were conquered by the English, in February, 1796.

At Bencoolen, where this tree was introduced in 1798, they have grown with the greatest luxuriance; for in five years they had arrived at from ten to fourteen feet in height, when (in October and November, 1802) two hundred and forty-seven trees, out of about six hundred, blossomed. About half of these were completely male; the rest female; and were expected to ripen their fruit in February, and March, 1804.

In the Botanic Garden at Calcutta, where the young trees are about the same age, the most luxuriant are from six to ten feet high, and in April, 1803, three male trees only blossomed, for the first time.

At Prince of Wales' Island, where by far the most extensive plantations are formed, they are in a middle state, between Bencoolen and Bengal.

Since writing the above (now January, 1805) the trees at Bencoolen have produced quantities of ripe nutmegs, of a good quality. Those at Prince of Wales Island, so far as I can learn, have not produced any fruit. In the Botanic Garden at Calcutta, two trees, seven and-a-half years old, and ten and twelve feet high, bore only male flowers for the two first years of their blossoming. Lately (at the close of 1804) they have produced only female flowers, some of which have proved fertile.

275. MUSA SAPIENTUM.

Linn. sp. pl. ed. Willd. 4, *p.* 894.

Spadix drooping. *Spathes* ovate, many-flowered, deciduous, (those of the *Female hermaphrodite* flowers of the wild plant, often wither and remain till the seeds are ripe, but in the cultivated varieties they are always deciduous.)

Bala. *Rheed Mal.* 1. *p.* 17. *t.* 12. 13. and 14.

Musa. *Rumph. Amb.* 5. *p.* 125. *t.* 60.

Ram-Kulla, Wally-Kulla, Ram-jacki-allia-kulla, are the names the wild *Banana* and *Plantain* are known by at *Chittagong;* where they are found indigenous, in the forests, and blossom during the rains.

Codali, or Cadali, the Sanscrit name of the cultivated *Banana.*

Kulla, Keyla, or Kayla, are the Hindu and Bengali names of the cultivated *Banana,* and Katch kulla, the *Plantain.*

Aretti, the Telinga name of the cultivated *Banana,* and Komaretti the cultivated *Plantain.*

OBSERVATIONS.

The varieties of the *Banana* cultivated over *India* are very numerous; but fewer of the *Plantain,* as I have hitherto obtained knowledge of only three, whereas, I may safely say, not less than ten times that number of the former have come under my inspection.

Their duration, culture, habit, and natural character, are already well known. I will therefore confine myself to (what I think) the original wild *Musa,* from which, I conclude, all the cultivated varieties (of both *Plantain* and *Banana*) proceed.

In the course of two years, from the seed received from *Chittagong,* these attained to the usual height of the cultivated sorts, which is about ten or twelve feet. They blossom at all seasons; though generally during the rains; and ripen their seed in five or six months after, when the plant perishes down to the root, which long before this time has produced other shoots; these continue to grow up, blossom, &c. in succession for several years. Their leaves are exactly as in the cultivated sorts.

DESCRIPTION.

Spadix simple, drooping.

Spathes partial, numerous, ovate, concave, smooth, crimson on the inside; outside darker coloured those (say 6 or 8) nearest the base of the spadix embrace a double row of *female hermaphrodite* flowers, and are not always deciduous, but sometimes wither, and remain till the seeds are ripe. All the rest, and they are very numerous, expanding in succession for two or three months, embrace similar double rows of *abortive* or *male hermaphrodite* flowers, which with their spathes, are always deciduous.

Calyx no other than the just-mentioned spathes.

Corol of two dissimilar petals; the *exterior* with unequally 5-toothed apex, which soon becomes revolute. *Inner* (sometimes called the *nectary,*) half the length of the exterior, when forcibly expanded nearly round, but in their natural state oblong, and deeply concave, with emarginate apex, and an incurved, uniform point.

Filaments (in both flowers) five, with sometimes the rudiment of a sixth. *Anthers* in the *male hermaphrodite* linear, and as long as the filaments, in the *female hermaphrodite* minute, and without pollen.

Germ inferior, oblong, 3-celled, with 4, 5, or 6 rows of ovula in each, regularly attached to a central, fleshy receptacle (axis,) by their growth they are forced from the regular situation in which they are found in the germ, their insertions cannot then be easily traced; in the male hermaphrodite abortive. *Style* cylindric. *Stigma* 3-lobed, large and clammy.

Berry oblong, tapering to each end, of a soft, fleshy consistence, smooth and yellow, marked longitudinally with five ribs, 3-celled, the partitions distinct, but soft and pulpy, and no doubt disappear when dry, and long kept.

Seeds numerous, size of a small pea, round-turbinate, tubercled, exterior, half dark chestnut colour, or blackish; towards the umbilicus, which is a large, circular cavity, light brown. *Integument* single, &c. as described and figured by *Gærtner, vol.* 1. *p.* 28. *t.* 11.

276. ALPINIA LINGUIFORMIS.

Spikes radical, linear, rather open. *Lip* linguiform, bifid, base broad, and spurless, sides incurved.

OBSERVATIONS.

A native of the interior parts of *Bengal,* where it blossoms during the early and latter parts of the rains.

DESCRIPTION.

Root perennial, throwing off numerous suckers, which run both above and under the surface of the earth; by which this species is soon multiplied.

Stems many, erect, or nearly so, as thick as a man's forefinger, smooth; 4-6 feet high.

Leaves bifarious, sessile on their sheaths, lanceolate, smooth on both sides: length 12-24 inches, by 4-5 broad. *Sheaths* smooth, and rise a little above the insertion of the leaf.

Spikes radical, solitary, the apex only rising above the soil, laxly imbricated with oblong, obtuse, smooth, exterior and interior, one-flowered, green *bractes;* besides the interior proper, tubular, thin, colourless bracte or *inferior calyx.*

Calyx superior, tubular, length of the tube of the corol; *mouth* 3-toothed, and split well down on one side; colour from the middle upwards deep red.

Corol: exterior border of three, sublanceolate, obtuse, red segments. *Lip* sublinguiform, the base broad, and rises incurved, forming an envelope for the stamen; from thence projects nearly horizontal, into a long, linear, bifid lamina, with curled margins; colour yellow, with a little red down the centre.

Stamina as in the genus.

Germ hairy, 3-celled: *ovules* many, attached to one fleshy receptacle in the inner angle. *Style* embraced at the base by the *nectarial bodies,* which are in this species bidentate.

Stigma large, and red.

277. AMOMUM SUBULATUM.

Leaves lanceolar, smooth. *Spikes* obovate, echinated with the long subulate points of the bractes, calyx, and upper segment of the exterior border of the corol. *Lip* oblong. *Crest* truncate, undivided,

OBSERVATIONS.

A native of the lower range of the *Morungh* mountains skirting the plains of *Bengal* on the north, where it grows on the borders of the rills of water between the hills. Flowering time, in the Botanic Garden at *Calcutta*, March and April; and the seed ripen during the rains.

DESCRIPTION.

Root tuberous, creeping at a small distance under the surface of the soil, &c. as in the genus and amply furnished with numerous, strong fibres; colour a dull reddish purple on the outside, with the interior substance itself considerably brighter.

Stems erect, about 3 or 4 feet high, and about as thick as the little finger.

Leaves alternate, bifarious, sessile on their sheaths, narrow-lanceolar, finely accuminate, deep green, and smooth on both sides; 12-15 inches long, by 3-4 broad.

Sheaths smooth, margins coloured, and rising above the mouth into an emarginate stipule.

Spikes radical, compact, a little elevated above the soil, obovate, size of a goose-egg, echinate with the long, subulate, pale yellow points of the bractes, inner calyx, and upper segment of the exterior border of the corol.

Bractes numerous, the *exterior* imbricated upward, obovate, dark red, smooth, long subulate pointed, one-flowered; the *inner*, or *inferior calyx* spathiform, opening on one side.

Flowers large, yellow.

Calyx superior, 3-cleft. *Segments* subulate, and greatly longer than the tube of the corol.

Corol: exterior border of three, nearly equal segments, the upper one ends subulate. *Lip* oblong, often emarginate; margins a little curled; deeper yellow than the exterior segments.

Filament flat, &c. *Anthers* 2-lobed, and crowned with entire crest.

Germ 3-celled, with many *ovula* in each, attached to the thicker partitions a little removed from the axis. *Style*, *Stigma* and *Nectarial scales* of Kœnig, as in the genus.

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278. KÆMPFERIA OVALIFOLIA.

Leaves oval. *Spikes* central. *Crest* of the anthers laciniate.

OBSERVATIONS.

A native of the peninsula of *Malacca*, and from thence sent by Major Farquhar to the Botanic Garden at *Calcutta*, where they blossom in July. It is an intermediate species, both with respect to size and habit, between *K. galanga* and *rotunda*, and ought to be placed between them in the system.

DESCRIPTION.

Root tuberous, as in the other species, and about biennial.

Stems very short, I may say scarce any.

Leaves few, bifarious, patent, oval, with a short acute point, smooth on both sides: about 6 inches long, by 4 broad.

Spikes central, hid by the short sheaths of the leaves, few-flowered, and they expand in succession; all pure white, except the purple lip.

Corol nearly as in *rotunda* and *angustifolia*, the upper two segments of the inner border are obtusely lanceolate, as in the latter; the *lip* or nectarium of a deep variegated purple colour, the shape cuneate-obcordate, and divided from the apex nearly half the whole length, into two, long, emarginate lobes.

Filaments short. *Anther* 2-lobed, and crowned with a large laciniate, erect, white crest.

Germ 3-celled, &c. as in the genus.

DALRYMPELEA.*

PENTANDRIA MONOGYNIA.

NATURAL ORDER, RHAMNI, Juss.

GENERIC CHARACTER.

Calyx 5-leaved. *Petals* five, alternate with the stamina. *Germ* superior, 3-celled, cells many-seeded, insertion interior. *Berry* 3-celled. *Seeds* few, nuciform. *Embryo* sub-inferior, and furnished with albumen.

In memory of the late *Alexander Dalrymple*, Esq. author of the Oriental Repertory, *&c. &c.*

279. DALRYMPELEA POMIFERA.

OBSERVATIONS.

Junky-jam, the vernacular name in *Silhet*, where it is a native, and grows to be a large tree. Flowering in March; and the seed ripen in September, and October.

DESCRIPTION.

Young shoots rather succulent, round, and perfectly smooth.

Leaves opposite, unequally pinnate, and some of them ternate; from ten to twenty inches long. *Leaflets* as far as three or four pair, and a terminal one, the pairs opposite, all are more or less petiolate, oblong, obtusely-serrate, acuminate, smooth: 5-6 long, by 2-3 broad.

Petioles and *petiolets* round and smooth.

Panicles terminal, spreading much, fully broader than long; primary branches, decussate; partial alternate, with the small, yellowish white flowers crowded round their extremities, every part smooth.

Bractes to the primary branches of the panicle opposite, &c. as in the *Rubiaceæ*, the rest solitary under each division and subdivision.

Calyx inferior, 5-leaved; *leaflets* rather unequal, and oval.

Petals five, oblong, obtuse, spreading. *Nectary* acetabuliform.

Filaments five, alternate, with the petals and shorter than them, inserted under the nectary. *Anthers* ovate.

Germ superior, 3-lobed, indeed almost separable, 3-celled; *ovules*

* Turpinia, *Ventenat Choix de Plantes*. 31. R. B.

about eight in each cell, widely attached to the axis. *Style* length of the germ, 3-grooved. *Stigma* 3-lobed.

Berry drupaceous, has the appearance of a pome, of a roundish 3-lobed form, very fleshy, when ripe yellow, and almost smooth, size of a large medlar, 3-celled.

Seeds, several in each cell, shape various, the most common roundish reniform, and considerably compressed, attached to the partition. *Integument* single, thick, and of great hardness, in fact a perfect nut, exterior surface brown and highly polished.

Perisperm conform to the seed.

Embryo obliquely-inferior. *Cotyledons* cordate, 3-nerved. *Radicle* oval, obliquely centrifugal.

WILLUGHBEIA.

NATURAL ORDER APOCINEÆ Juss.

GENERIC CHARACTER.

Calyx 5-toothed. *Corol* hypocrateriform. *Stigma* capitate. *Germ* one-celled; *ovules* many, attached to two opposite parietal receptacles. *Berry* one-celled. *Seeds* few, nidulent. *Embryo* without albumen.

280. WILLUGHBEIA EDULIS.

Shrubby, scandent. *Leaves* opposite, oblong, acuminate. *Flowers* in small axillary fascicles. *Berries* very large, from oval to spherical.

OBSERVATIONS.

Latti-Am the vernacular name in *Chittagong*, *Silhet*, &c. where it grows to an immense size, running over the largest trees. It is in flower and fruit nearly the whole year.

DESCRIPTION.

Bark of the trunk and large branches, of large old plants, above half an inch thick, inwardly dark brown; surface tubercled; taste somewhat astringent.

Leaves opposite, short-petioled, oblong, acuminate, entire, polished; veins simple, and parallel: length 3-5 inches, by 1-2 broad.

Peduncles axillary and terminal, solitary, short, each supporting a few middling-sized, pale pink coloured, short-pedicelled flowers, forming small fascicles.

Bractes solitary at the base of each pedicel, ovate.

Calyx one-leaved, 5-toothed; *segments* ovate, subciliate.

Corol one-petalled, infundibuliform: *Tube* gibbous near the middle, where the stamina are lodged, a little hairy on the inside: *Border* of five, sublanceolate, smooth, expanding segments, which are imbricated in the bud.

Filaments short, inserted into the tube of the corol, a little above its base. *Anthers* subsagittate, but do not adhere to each other, on each side a polliniferous groove.

Germ superior, ovate, smooth, one-celled; *ovules* many, attached to two opposite parietal receptacles. *Style* short. *Stigma* conical, and closely embraced by the anthers.

Berry size of a large lemon, subovate, covered with a thick, friable, pretty smooth, brownish yellow cortex, one-celled.

Seeds many, nidulent in a soft yellowish pulp, which is intermixed with softer cottony fibres, size of a small garden bean, shape various. *Integuments* two; *exterior* rather fleshy, and seems to furnish the soft fibres with which the pulp is intermixed; *interior* thin and friable.

Albumen none.

Embryo: Cotyledons conform to the seed, firm, straw-colour with a tinge of pink; while fresh, if wounded, a quantity of milk exudes, which soon becomes bad caoutchouc. *Radicle* small, roundish.

OBSERVATIONS.

Every part of the plant, on being wounded, discharges copiously, a very pure white viscid juice; which is soon, by exposure to the open air, changed into an indifferent kind of elastic rubber, or caoutchouc. The fruit is eaten by the natives where it grows, and by them reckoned good.

281. ECHITES GRANDIFLORA.

Scandent. *Leaves* cuneate-oblong. *Cymes* terminal, and axillary. *Leaflets* of the calyx lanceolar, waved, and coloured. *Corol* campanulate. *Follicles* linear.

OBSERVATIONS.

A native of the hilly parts of *Chittagong* and *Silhet*, where it blossoms during the dry season and the seed take nearly one year to ripen.

DESCRIPTION.

Stem and large *branches* ligneous, and scandent to a very great extent; *young shoots* villous.

Leaves opposite, short-petioled, from oblong-cuneiform to obovate-oblong, entire, apex rounded with a short point, void of pubescence, but hard: 6-8 inches long, by 2-5 broad.

Cymes axillary, becoming lateral, short, few-flowered, all the parts thereof clothed with ferruginous down.

Flowers very large, equalling those of *Solandra grandiflora*, pale greenish-yellow.

Bractes oblong, coloured, and veined.

Calyx to the base divided into five, long, lanceolate, waved, acute, coloured, veined *segments*.

Corol campanulate. *Border* expands about five inches, and is divided into five, oval, waved, rather acuminate broad segments.

Stamina: Filaments five, nearly as long as the corol, ascending in a gentle curve, smooth, inserted into the base of the bell of the corol. *Anthers* sagittate, sides firmly united, forming a conical cover for the *stigma* to which they cohere.

Germ 2-lobed, hairy, 2-celled: *ovules* numerous, attached to a jugiform receptacle in each cell, rising from the partition. *Style* length of the stamina. *Stigma* large, clammy.

Follicles horizontal, linear, obtuse, pretty smooth, thick as the little finger; points rather incurved, and obtuse; 6-10 inches long.

Seeds numerous, imbricated, oblong, compressed, brown, comose. *Coma* very ample, I have rarely seen so large, points to the apex of the follicle.

Albumen thin, light gray.

Embryo straight. *Cotyledons* oblong. *Radicle* long, cylindric, superior.

HOLIGARNA Buchanan.

PENTANDRIA TRIGYNIA.

GENERIC CHARACTER.

Polygamous. *Calyx* 5-toothed. *Petals* five. *Nut* inferior, ovate, cellular, one seeded. *Embryo* inverse, without albumen.

282. HOLIGARNA LONGIFOLIA B.

Cattu-tsjeru, or Katou-tjeroe. *Rheed. mal.* 4. *p.* 19. *t.* 9.

OBSERVATIONS.

A large tree, a native of the mountainous parts of *Chittagong*, where it blossoms in January. Dr. Buchanan first found the *male* tree in *Chittagong*, and some years after he found the *female (hermaphrodite)* in *Malabar*, and gave it the name *Holigarna*, from its appellation in the language of *Karnata*. He thinks it is the variety called *Bibo*, of the *Cattu-tsjeru*. (*Rheed. mal.* 4. *t.* 9.) and says the natives of *Malabar*, by incision, extract an exceedingly acrid juice, with which they varnish their targets. I am, however, inclined to consider *Van Rheede's Cattu-tsjeru* to be this very tree; and his Bibo, or *Tseejero. vol.* 4. *p.* 20. to be *Semecarpus Anacardium.*

DESCRIPTION.

Trunk straight; in a twelve year old tree, male tree, ten inches in circumference. *Bark* smooth, ash-coloured. *Branches* patent; height of the whole tree twenty-five feet. In its native soil the trunk attains to the thickness of six feet in circumference; and the total height of the tree above fifty.

Leaves alternate, crowded about the ends of the branchlets, short-petioled, narrow-cuneiform, entire, acute, smooth on both sides, but paler underneath; length from one to two feet, by 3-6 inches broad.

Petioles short, and thick, and armed with generally two subulate inoffensive incurved (thorn-like) bodies on each side of the margin.

Stipules no other than the last mentioned subulate bodies on the petioles.

MALE.

Panicles axillary, single, greatly shorter than the leaves.

Flowers numerous, small, dull white.

Bractes small, ferruginous.

Calyx 5-sided; *angles* somewhat sharp.

Corol flat, to the base 5-parted, (or it may be called 5-petalled); *segments* oblong, villous.

Filaments five, shorter than the corol. *Anthers* incumbent.

FEMALE HERMAPHRODITE on a separate tree.

Panicles, bractes, calyx, and *corol* as in the male.

Stamina as in the male, but greatly smaller, with minute, seemingly abortive *anthers.*

Germ inferior, a little hairy; in it one compressed cell, containing a single compressed *ovule*, attached to one side of the top of its cell. *Styles* three, recurved. *Stigmas* crescent shaped, little hairy.

Nut inferior, naked, exactly ovate, a little compressed, size of a large olive, smooth, when ripe yellow, one-celled, evalvular. *Shell* rather thick, and contains between its laminæ numerous cells, filled with a black, rather thick, acrid fluid, as in the common *Marking Nut*, or *Anacardium.*

Seed conform to the nut. *Integument* single, membranaceous.

Albumen none.

Embryo conform to the seed, inverse. *Cotyledons* equal, ovate, yellowish. *Corcle* lateral. *Plumula* hairy, acute. *Radicle* oblong, inverse, attached to one edge of the cotyledons considerably below their apex, and corresponding with the attachment of the *ovule* in the germ.

MARLEA.*

OCTANDRIA MONOGYNIA.

GENERIC CHARACTER.

Calyx 6-8-toothed, superior. *Petals* 6-8. *Germ* inferior, 2-celled. *Cells* one-seeded, attachment superior. *Drupe* with 2-celled nut. *Embryo* inverse, furnished with *albumen.*

283. MARLEA BEGONIFOLIA.

OBSERVATIONS.

Marlea the vernacular name in *Silhet*, where it is indigenous, grows to the size of a small tree; yielding timber employed by the natives in the construction of their houses. Flowering time the month of April; seed ripe in July.

In its natural character it approaches near to *Alangium;* the number of *stamina*, and internal structure of the *germ* and *drupe*, are, however, so different as to induce me to consider it sufficiently distinct, to form a separate genus, which I do under its vernacular name *Marlea.*

DESCRIPTION.

Leaves alternate, petioled, unequally cordate, (as in the *Begoniæ*,) entire, or lobate, acuminate, smooth, five, or more nerved; length 4-8 inches, by 3-5 broad.

Petioles round, a little villous, about an inch long.

Stipules none.

Peduncles axillary, length of the petioles, dichotomous, many-flowered.

Flowers of a middling size, short-pedicelled; *petals* white.

Calyx superior, small, 6-8 toothed.

Petals 6-8, linear, recurved.

Filaments eight, short, flat, hairy, inserted within the petals on a glandular hemispherical body, which crowns the germ. *Anthers* linear, very long.

Germ inferior, 2-celled, with one *ovule* in each, attached to the top of the axis. *Style* length of the stamina. *Stigma* large, 4-toothed.

Drupe oval, obtuse-pointed, size of a small cherry, pulp in small quantity, but soft, and dark-coloured; round the base of the

* Stylidium. *Lour. cochin. p.* 220. R. B.

obtuse point may be traced the minute remains of the calyx. *Nut* single, conform to the drupe, brittle, though hard, black, 2-celled, grooved on the sides, apex transversely 2-toothed.

Seed solitary, oval, flattened. *Integument* single, thin.

Albumen conform to the seed, soft and oily.

Embryo inverse, nearly as extensive as the perisperm. *Cotyledons* ovate-cordate, obtuse. *Radicle* superior, oval.

XANTHOPHYLLUM R.

OCTANDRIA MONOGYNIA.

NATURAL ORDER, CAPPARIDEÆ, Juss.

GENERIC CHARACTER.

Calyx 5-leaved. *Corol* 5-petalled, sub-papilionaceous. *Germ* superior, pedicelled, one-celled. *Ovula* a few, on two opposite parietal receptacles. *Berry* one-seeded. *Embryo* transverse, without albumen.

284. XANTHOPYHLLUM VIRENS.

Panicles interfoliaceous and terminal. *Germ* 4-seeded.

Gundee, of the Bengalese.

OBSERVATIONS.

A large timber tree, a native of the thick forests of *Silhet*, where it blossoms in March; and the seed ripen in June and July. The wood said to be remarkably hard and useful to the natives.

DESCRIPTION.

Branches and *branchlets* very numerous, and much crowded, smooth.

Leaves alternate, short-petioled, from oblong to lanceolar, entire, of a firm texture, and polished: length six inches, and from one and a half to two and a half broad.

Stipules none.

Panicles terminal, and between the leaves (internodal,) very numerous, and pretty much crowded with flowers; in general they are shorter than the leaves, and every part smooth.

Flowers numerous, rather small, colour a mixture of pink and yellow, generally solitary, pretty long-pedicelled.

Bractes tern at the base of each solitary pedicele, small, ensiform, villous, caducous.

Calyx 5-leafed, rather unequal, the lower two and superior one being smaller.

Petals five, the superior and lateral four are nearly equal, sub-spatulate-falcate; the upper two form what may be called the vexillum; the fifth or lower one (*carina*), boat-shaped, unguiculate, and pink-coloured.

Filaments eight, incurved, nearly equal, shorter than the corol, and hairy; *four* of them are inserted on the claws of the upper four petals, *two* on the claws of the lower (the *carina*), and the remaining *two* into the receptacle, between the two petals which form the *vexillum* and the two *wings*. *Anthers* oval.

Germ superior, short-pedicelled, the insertion of which is embraced by a 7-angled, nectarial cup, round, ribbed, a little hairy, one-celled, and contains four *ovula*, attached two and two, to two opposite, sub-parietal receptacles, near the base of the cell.

Style length of the stamina, toward the apex incurved. *Stigma* slightly 2-lobed.

Berry globular, short-pedicelled, of a firm fleshy texture, when ripe olive-coloured, and about the size of a pigeon's egg, one-celled.

Seed solitary, nearly round; attachment lateral. *Integument* single, rather thick and brownish.

Albumen none.

Embryo transverse, green. *Cotyledons* two, conform to the seed, equal. *Radicle* lateral, truncate, lodged immediately within the umbilicus of the seed, and pointing to it.

XANTHOPHYLLUM FLAVESCENS R.

Panicles axillary and terminal. *Germs* 8-10-seeded. Two *glands* on the back of the leaves near the base.

Agensak, of the Bengalese.

OBSERVATIONS.

A large tree, a native of the hilly parts of the province of *Chittagong:* where it blossoms in May, and is so very like the former species, *virens*, that I was for some time inclined to consider them only varieties of one species; but attentive examinations made at various times, give me reason to think they are sufficiently distinct. In the former, *virens*, the *leaves* continue green when dry, and are destitute of the two small, hollow glands on the base of the lower pair of veins, one on each side of the lower end of the rib, or nerve, which particularly mark *flavescens*. The *panicles*, except those that terminate the twigs, are in this perfectly axillary; in *virens* far above the axils, and their insertions accompanied by two or three vertically situate *knobs*, or *buds*, as in some species of *Capparis*, &c. In *virens* the *germ* has never more than four *ovula*, inserted by pairs on opposite sides near the bottom of the cell: while in *flavescens* there are from eight to twelve *ovula* in the germ, inserted on opposite sides of the cell, from the base to near the top. In *virens* the stigma is large and more or less 2-lobed; in *flavescens* simple. In other respects they agree so well, that it seems unnecessary to figure more of *flavescens*, than the back of the base of one leaf, to shew the two glands; and two sections of the germ.

285. BAUHINIA ANGUINA.

Scandent. *Stem* compressed, flexuose; flexures approximate, regularly and alternately concave and convex on the two flat sides. *Leaves* subcordate, smooth, entire, or 2-lobed; lobes subtriangular, and acuminate. *Panicles* terminal; flowers triandrous. *Legumes* oval, smooth, 1-2-seeded.

Naga-mu-valli. *Rheed. mal.* 8. *p.* 57. *t.* 30. and 31.

Folium linguæ *Rumph. amb.* 5. *p.* 1. *t.* 1. cannot be this, and to it I leave the old Linnæan specific name *scandens*, or some better, because there are many scandent species already known.

Nag-fut (snake charm,) the vernacular name in *Silhet*

OBSERVATIONS.

This is the most extraordinary as well as one of the most extensive ramblers I have met with. It is a native of the mountainous tracts in the vicinity of *Silhet, Chittagong*, &c. and the most regularly serpentine pieces of the stems, and large branches, are carried about by our numerous mendicants, to *keep serpents off*. Flowering about the end of the rains, and the seed ripen in the cool season.

DESCRIPTION.

Stems and large *branches* are flat, being from four to six inches broad, and scarce half an inch thick; when old the margins become double, like the letter Y or T, and pretty straight, whereas the body, or space between them is most regularly flexuose, with the flexures alternately convex and concave. *Bark* rather rough, and ill defined. *Wood* hard, but porous, and nearly white. *Branches* and *branchlets* bifarious, and regularly alternate, from the flexures just mentioned.

Tendrils simple, or bifid, permanent.

Leaves bifarious, alternate, petioled; on the older plants entire or nearly so, and round-cordate; on young plants, and on the luxuriant shoots more or less bifid, with the lobes narrow, and taper much to their points; 5-7-nerved, smooth on both sides; from two to six inches each way.

Panicles terminal, composed of long, simple racemes, of numerous, very small white flowers.

Calyx cup-shaped, unequally 5-toothed.

Petals five, obovate, short-clawed.

Stamina only three, and all fertile.

Germ short-pedicelled, oblong, inserted on the under margin of a large 2-lobed gland, which occupies the centre of the flower, one-celled, 2-seeded. *Style* short. *Stigma* simple.

Legume oblong, thin, edges even, apex a small recurved point, both sides smooth, about two inches long, by one broad, one-celled.

Seeds one or two, two most common, oval, with an obtuse point on the anterior upper part, which is formed by the radicle, compressed, smooth. *Integuments* in the recent state single.

Albumen in considerable quantity in the fresh seed.

Embryo curved, &c. as in the order.

286. CYNOMETRA POLYANDRA.

Leaves pinnate. *Branchlets* floriferous. *Flowers* polyandrous.

OBSERVATIONS.

Peing, the vernacular name in *Silhet*, and the adjacent mountain forests, where it grows to be a very large, and useful timber tree. Flowering time March and April; and the seed ripen during the rains, viz. in July and August, and are eaten by the natives of the hilly countries where they grow.

DESCRIPTION.

Young shoots flexuose, round, and smooth.

Leaves alternate, subsessile, abruptly-pinnate, about six inches long. *Leaflets* two or three, rarely four pair, sessile, opposite, unequally-oblong, or broad-lanceolate, entire, emarginate, firm, and glossy: about three inches long, and from one to one and a-half broad.

Stipules ensiform.

Corymbs axillary, single, or in pairs, sessile, simple, shorter than the leaves. *Peduncles* and *pedicele* nearly equal in length, clothed with ferruginous down.

Bractes from ovate, at the insertion of the pediceles and round the base of the common peduncles, to filiform on the pediceles.

Flowers large, yellow.

Calyx 4-leaved: *leaflets* opposite, rather unequal, oval, entire, thin, smooth, coloured, soon become reflexed.

Petals five, lanceolar, nearly equal, inserted between the calyx and stamina,

Filaments 40-60; rather longer than the petals, united into something like a ring round the base of the pedicele of the germ. *Anthers* roundish.

Germ pedicelled, superior, obliquely oblong, one-celled, and contains one, rarely two *ovula*, attached to the upper margin of its cell. *Style*, curved, but the direction alters according to the length of time the flower has been expanded. *Stigma* enlarged.

Legume fleshy, 2-3 inches long, by about two broad, sub-semilunar tubercled, light brown, one-celled.

Seed solitary, rarely two, sub-reniform, compressed. *Integument* single, smooth, a little veined.

Albumen none.

Embryo conform to the seed. *Radicle* oblong, immersed, centrifugal. In short in all respects very like the legume, &c. of *Cynometra cauliflora*. *Gært. sem.* 2. *p.* 350.

287. STERCULIA ALATA.

Leaves cordate, entire, 3-5 nerved. *Racemes* crowded about the ends of the branchlets, length of the petioles. *Follicles* subrotund. *Seeds* numerous, winged.

OBSERVATIONS.

A native of the countries immediately to the east of *Bengal*, where it grows to be a large, handsome, very ramous tree. Flowering time in the Botanic Garden, February and March, and the seed ripen about the close of the year. In the province of *Chittagong* the tree is called *Buddh-narculla*, which may be translated *Buddha's Coco-nut*. Narikella being one of the Sanscrit names of the *Coco-nut*. In *Silhet* it is called Toolah, and there the seeds are said to be eaten by the natives as a cheap substitute for *opium*.

DESCRIPTION.

Trunk (in trees twenty-five years old, now growing in the Botanic Garden at *Calcutta*,) straight, tall, four feet above the ground three feet and a half in circumference. *Bark* quite smooth, and ash-coloured. *Branches* numerous, toward the top of the tree ascending, below divaricate. In its native soil they arrive at a much greater size; viz. ten feet in circumference, and above one hundred feet high.

Leaves alternate, about the ends of the branchlets, petioled,

cordate, entire smooth 3-5-nerved; from four to twelve inches long, and from three to eight broad. Deciduous about the time the blossoms appear in February and March.

Petioles round, smooth, from one to four inches long.

Stipules minute, subulate, caducous at a very early period.

Racemes axillary, sometimes terminal, then sub-panicled, but the most common mode is racemes in pairs from the axils of the former year's leaves toward the end of the branchlets, and about as long as the petioles, or more; densely clothed with ferruginous, stellate pubescence.

Flowers pretty large, short-pedicelled, reflex, male and female on the same racemes.

Bractes ensiform, three under each flower, and caducous at a very early period.

Calyx campanulate, divided nearly to the base, into five, thick, fleshy, recurved, lanceolar segments; outside clothed with ferruginous, stellate pubescence; inside elegantly striated with crimson and yellow.

Corol none.

MALE HERMAPHRODITE FLOWERS.

Column of the abortive fructification, and stamina cylindric, greatly shorter than the calyx, straight.

Filaments scarce any. *Anthers* imbricated in five fascicles of about five each, which unite below the middle, and form a cup round the five imperfect germs.

FEMALE HERMAPHRODITE FLOWERS.

Column none.

Stamina: five sessile bundles of imperfect anthers embrace the five grooves of the base of the germs.

Germs five; singly semiovate, one-celled, with two rows of *ovules* in each, vertically attached to the inner angle of the cell. *Styles* short, recurved, villous. *Stigmas* rather broad, and emarginate.

Follicles, or rather *leguminous capsules* from one to five, from the size of a man's fist, to that of an infant's head, nearly round, long-peduncled, one-celled, one-valved; *valve* thick, tough, and very fibrous; surface densely clothed with a brownish-olive, mealy pubescence.

Seeds many, attached to the margins of the valve, oblong, considerably compressed, each terminated by a long, broad, spongy wing, (hence the specific name), which becomes thin, and sub-membranaceous at the apex. *Integuments* three; *exterior* a brown, friable, spongy body, which with a few fibres form the wing; *middle,* or *second* form, an oval nuciform envelope for the embryo only, (and seems composed of three parts; the exterior and interior thin, brown, and friable, and the middle part thicker, tough and hard,) *interior* a thin membrane.

Albumen none.

Embryo: Cotyledons equal, conform to the seed, 3-nerved. *Plumula* 2-lobed. *Radicle* patelliform, lodged immediately within the umbilicus, (relative *centripetal.*)

288. VATERIA INDICA.

Leaves alternate, oblong, entire, smooth, coriaceous. *Panicles* terminal.

Vateria indica. *Linn. sp. pl.* 734. *Gært. sem.* 3. *p.* 53. *t.* 189.
Elæocarpus copalliferus *Retz. Obs.* 4. *p.* 27. *Linn. spec. plant. edit. Willd.* 2. *p.* 1170. *Vahl. symb.* 3. *p.* 67?
Paenoe. *Rheed. mal.* 4. *p.* 33. *t.* 15.

OBSERVATIONS.

A very large and handsome tree, a native of Malabar. In the Bidanore country, where my specimens are from, it is called the Dammer tree, and blossoms during the hot season. *Seed* ripe in August.

DESCRIPTION.

Young shoots, and all the tender parts, except the leaves, covered with fine stellate pubescence.

Leaves alternate, petioled, oblong, entire, from emarginate, to obtuse-pointed, smooth, coriaceous, from four to eight inches long, and from two to four broad.

Petioles round, about an inch long.

Stipules oblong, caducous.

Panicles terminal; *ramifications* rather remote.

Flowers rather remote, pedicelled, pretty large.

Bractes oblong, one-flowered, caducous.

Calyx to the base 5-cleft; *divisions* oblong, obtuse, villous on the outside.

Corol 5-petalled, contorted. *Petals* oval, emarginate, broader, but very little longer than the divisions of the calyx.

Filaments 40-50, short, broad, inserted between the petals, and the base of the germ. *Anthers* linear, with a single filiform beak.

Pistil. Germ above, conic, downy, (one-celled with the rudiments of three or four seeds.) *Style* longer than the stamens. *Stigma* simple, truncate.

Pericarpium: a coriaceous, fleshy, oblong, obtuse, one-celled, 3-valved *capsule;* general size about two and a half inches long, and one and a half in diameter.

Seed solitary, shape of the capsule.

Note.—In all the flowers examined by me, the stamina had uniformly short, broad filaments, and linear anthers terminating in a single, tapering, acute thread, or soft bristle. Can Kœnig's Ceylon tree with two bristles be the same? The superior calyx of Retzius I must consider a mistake.

ROYDSIA.

POLYANDRIA MONOGYNIA. *Sect. Apetalous.*

GENERIC CHARACTER.

Calyx inferior, 6-parted. (*Corol* none.) *Stamina* on a columnar receptacle. *Germ* pedicelled (above the insertion of the

filaments) 3-celled, many-seeded. *Stigma* 3-cleft. *Drupe* one-seeded. *Embryo* erect, without albumen.*

289. ROYDSIA SUAVEOLENS.

OBSERVATIONS.

Maudobe-lata the vernacular name in *Silhet*, where the plant is indigenous. Flowering time the month of March, when its numerous blossoms diffuse a strong, but pleasant odour through the forests where they grow. *Seed* ripen in August and September.

DESCRIPTION.

Stem stout, woody, and with its numerous branches climbing over trees to a great extent. *Bark* of the young shoots green, void of pubescence, but covered with numerous, small, elevated, whitish specks.

Leaves alternate, short-petioled, oblong, entire, of a firm texture, and smooth on both sides, sometimes pointed: length about six inches, and about two and-a-half and three broad.

Stipules none.

Inflorescence terminal and axillary; when terminal it is generally a long, slender *panicle*, as long as the leaves; when axillary a simple *raceme*.

Flowers numerous, alternate, short-pedicelled, pretty large, pale yellow, and fragrant.

Bractes solitary, oblong, villous, one-flowered.

Calyx inferior, one-leaved, 6-cleft, villous; *segments* ovate in a double series; exterior three rather larger.

Corol none, nor any thing like a nectarial organ.

Filaments numerous (about one hundred), length of the pistillum and its pedicel, inserted on the apex of a short column. *Anthers* incumbent.

Germ pedicelled above the elevated receptacle of the stamina; oblong, 3-celled, with about two rows of *ovules* in each, attached to the axis. *Style* very short. *Stigma* trifid.

Drupe pedicelled, size of a large olive, oval, covered with a rather scabrous, orange-coloured, thin, brittle cortex, one-celled. *Pulp* in considerable quantity, soft and yellow. *Nut* oblong, texture of a soft ligneous nature and thin, one-celled, 3-valved.

Seed solitary, conform to the nut: *Integument* single, membranaceous.

Albumen none.

Embryo erect. *Cotyledons* two, unequal; the larger deeply concave, receiving the smaller doubled one into its concavity as in the *Shoreæ*; they are of a firm fleshy texture, and yellowish. *Radicle* inferior, and rather within the base of the *cotyledons*.

290. UNONA LONGIFLORA.

Leaves linear-oblong. *Flowers* 2-3 petalled, of great length, and pendulous *Joints* of the *Berries* few and linear-oblong.

* This elegant, clearly-marked genus is named in honour of Sir JOHN ROYDS, one of the puisne Judges of the Supreme Court of Judicature of Bengal; a zealous Botanist and an eminent benefactor to the science.

OBSERVATIONS.

Collahcurrah, the vernacular name in *Silhet*, where it is indigenous; grows to the size of a large shrub, or small bushy tree. Flowers in April and May, and the seed ripen about the close of the rains.

DESCRIPTION.

Young shoots quite smooth, round, and flexuose.

Leaves alternate, bifarious, short-petioled, linear-oblong, entire, smooth on both sides, and particularly glaucous underneath; from six to twelve inches long, by 2-4 broad.

Peduncles axillary, solitary, from three to ten inches long, filiform, smooth, one-flowered.

Flowers uncommonly long, pendulous; outside bright orange, inside yellow.

Calyx 3-leaved: *leaflets* reniform-cordate, acuminate, very small, and hairy.

Petals two, rarely three, ensiform, thick, and fleshy, 6-8 inches long, both sides smooth; inside yellow, outside orange.

Stamina numerous, glandular-headed, forming, a hemispheric ball round the germs.

Germs 10-20, sessile, clavate, very hairy, one-celled, *ovules* a few, imbricated upward, and vertically attached to the inner margin of the cell. *Styles* short. *Stigma* large, recurved.

Berries several, long-pedicelled, drooping, 2-4-jointed: *joints* linear-oblong, or sub-cylindric, smooth.

Seeds one in each joint, and of the same form, smooth. *Integument* polished, of the consistence of parchment, 2-valved, from its inside innumerable fibres project into the albumen. *Embryo* in the base of the albumen, &c. &c. exactly as in the *Uvaria*; see *Gært. sem.* 2. 155. *t.* 114.

291. INCARVILLEA PARASITICA.

Shrubby, parasitic, smooth. *Leaves* opposite, lanceolar, veinless, fleshy. *Umbels* terminal.

OBSERVATIONS.

A native of the forests which cover the *Garrow* hills, where it is found growing on trees; but shows a partiality for such places as retain decayed vegetable matter. In the Botanic Garden at *Calcutta* it grows freely in a soil composed of rotten wood, and garden mould. Flowering time the rainy season, when nothing can exceed the beauty of its numerous, large, pendulous, crimson-yellow flowers, approaching in shape and size to those of *Digitalis purpurea*. Seed ripen in September and October.

DESCRIPTION.

Stem scarce any, but several, rather succulent, smooth branches, with swelled joints; from those the fibrous roots issue.

Leaves opposite, or nearly so, short, fleshy-petioled, lanceolar, acuminate; margins more or less curled; substance firm, fleshy, and veinless; length 4-6 inches, by one broad.

Umbels terminal, solitary, sessile, simple, many-flowered.

Flowers large, drooping, colour a beautiful mixture of orange and crimson.

Bractes: an oblong caducous one at the base of each pedicel.

Calyx tubular, somewhat gibbous; *mouth* 5-parted.

Corol tubular, curved. *Tube* somewhat ventricose; outside villous; *mouth* oblique and divided into five, nearly equal, semicircular segments, one above, and two on each side.

Filaments four, didynamous, extend beyond the mouth of the tube. *Anthers* linear, apices united.

Germ superior, linear, smooth; base embraced by a nectarial ring, 4-celled; *ovules* numerous, attached to the incurved margins of the partitions. *Style* length of the germ or more, protruded beyond the anther. *Stigma* entire, fleshy, subinfundibuliform.

Capsule siliquæform, pendulous, long and very slender, being about twelve inches long, and scarce so thick as a quill, smooth and brown, a groove on the opposite sides, 4-celled, 2-valved. *Valves* thin, almost membranaceous.

Seeds numerous, minute, imbricated, cylindric, rough; from the apex two long hairs, and from the base one; they are attached to the rolled in edges of the valves of the capsule, as in the germ.

Albumen none.

Embryo cylindric, inverse. *Cotyledons* oblong, not half the length of the whole embryo. *Radicle* cylindric, superior. When vegetation begins the structure of the parts become evident: the apex of the radicle first projects, from which innumerable most minute rays issue, and lay hold of the soil, or rather bark of the tree they are sown on, &c. as in the other parasites.

292. OROBANCHE ACAULIS.

Stemless: *flowers* crowded into irregular heads immediately on the roots: *corol* five parted, laciniate: *anthers* single, each of the inner pair augmented with a large, recurved, oval gland: *stigma* peltate.

OBSERVATIONS.

Found growing on the root of the *China* sugar cane, in the Botanic Garden at Calcutta, and in full blossom in September.

DESCRIPTION.

Root, I suspect annual, of many, thick, firm fibres, adhering to the roots of the China sugar cane.

Stem none.

Flowers numerous, short-peduncled, collected in large dense fascicles, even with the surface of the earth, very large: colour a beautiful lively purple.

Peduncles short, round, smooth, one-flowered.

Bractes triangular, fleshy, they embrace the base of one or more peduncles, uniting them into a tuft, close to the root.

Calyx one-leaved, length of the tube of the corol, fleshy, simple, opening on one side, or dividing into two unequal portions; outside tinged with red: inside white.

Corol with tube obliquely clavate, campanulate, smooth in every part. *Inside* yellow. *Throat* contracted, and trigonal. *Border* 5-parted; *the divisions* nearly equal, and about as long as the tube: *margins* laciniate.

Filaments smooth. *Anthers:* a large, oblong white gland, is attached to the base of the inner pair, appearing like a second anther.

Germ ovate. *Style* rather longer than the stamina, curved, smooth. *Stigma* peltate, very large, somewhat 3-lobed, glandulous, slightly villous.

Capsule ovate, one-celled, 2-valved, with two pair of ramous receptacles, to which the numerous, very minute seeds adhere.

CONGEA.

DIDYNAMIA ANGIOSPERMIA.

NATURAL ORDER, VITICES, Juss.

GENERIC CHARACTER.

Involucre few-flowered. *Calyx* tubular. *Corol* irregular. *Stamina* very long and distinct. *Germ* 4-celled, cells one-seeded, insertion superior. *Berry* one-seeded. *Embryo* erect, without albumen.

293. CONGEA TOMENTOSA.

Involucre 3-leaved, 6-9-flowered. *Stigma* entire. *Leaves* opposite, cordate.

OBSERVATIONS.

An immense climbing shrub; or, I may say, *tree;* a native of the forests of *Chittagong*, where it blossoms in March.

Bark of the large trunk, and old ligneous branches scabrous and ash-coloured: of young shoots tomentose.

Leaves opposite, short-petioled, cordate, entire, more or less villous according to age; 4-6 inches long, by 3-4 broad. *Floral leaves* small, and very downy.

Panicles axillary and terminal; composed of many, ascending, opposite pairs of tomentose branches, giving support to the opposite, single, peduncled umbellets of small white flowers.

Bractes from oblong to cordate, very downy, solitary, sessile, one at the base of each peduncle.

Involucre 3-leaved, 6-9-flowered; leaflets elliptic, downy, pink-coloured; some few of them emarginate; length above one inch, and above half an inch broad.

Perianth tubular, very hairy, 5-toothed.

Corol; tube length of the calyx: *border* bilabiate: *exterior* lip very long, and bifid; *under* or rather *interior* of three, oval, equal, sessile, segments.

Filaments didynamous, very long, greatly exceeding the exterior lip of the corol, variously bent. *Anthers* 2-lobed.

Germ subturbinate, &c. &c. exactly as in the former species.

Pericarpium not seen.

294. AMBROSINIA CILIATA.

Leaves sword-shaped; *spathe* shorter than the leaves, with a tubular base, and expanding ciliated apex.

OBSERVATIONS.

Found on the wet banks of rivulets, ponds, &c. near *Calcutta*. Flowering time the hot season.

DESCRIPTION.

Root perennial, perpendicular, tuberous, stoloniferous, with long fleshy fibres.

Leaves radical, petioled, lanceolate, veinless, somewhat fleshy, from six to thirty-six inches long.

Petioles: upper half cylindric, lower half sheathing, some spathaceous bracts surround their lower parts.

Scapes axillary, solitary, short, somewhat compressed.

Spathe: base tubular and somewhat bellied; middle portion cylindric and convolute; apex expanding, ovate-lanceolate, margins of the apex ciliated with long, flexible, purple filaments; the lower tubular portion where the fructification is lodged, is half separated (by a transverse membrane) from the upper portion, as in A. spiralis.

Stamens, filaments none. *Anthers* numerous, sessile, surrounding the lower portion of the stigma.

Pistil: Germ conical, crowned. *Style* cylindric. *Stigma* oblong, apex turbinate, lower portion surrounded with anthers.

Capsule roundish, 6-furrowed, and crowned with the six corresponding points of the ridges; 6-celled.

Seeds 6-8 in each cell, affixed by their bases to a central receptacle; each is augmented by a large spongy substance.

Embryo erect, furnished with an albumen and many subulate cotyledons, as in Pinus.

WALLICHIA.

MONOECIA HEXANDRIA.

GENERIC CHARACTER.

Spathe many-leaved. *Spadix* ramous.

MALE. *Perianth proper* one-leaved, entire. *Corol* 3-petalled

FEMALE. *Calyx* double: *Exterior* 2-leaved: *Interior* 3-parted. *Corol* 3-petalled. *Berry* 2-seeded. *Embryo* in the back of the seed.

295. WALLICHIA CARYOTOIDES.

Spadix terminal. *Leaves* pinnate. *Leaflets* wedge-shaped, variously præmorse.

OBSERVATIONS.

Chelputta, or Bhelputtah, it is called at *Chittagong*, where the plant is found indigenous, and blossoms in July; seed ripen during the cold season.

DESCRIPTION.

Trunk scarce any, until the plants blossom, and then it may be called the base of the spadix, rising above the fibrous margined sheaths of the fronds.

Leaves (*fronds*) few, alternate, pinnate, petioled, from three to eight feet long.

Leaflets sessile, variously disposed; the lowermost are generally in opposite fascicles, of two, or three; those farther on are for the most part single, and alternate; all are wedge-shaped:

lateral margins entire, apices præmorse at very various distances from the base, and jagged with the sharp point of numerous, parallel, fine fibres, which run up through the substance of the leaflets; upper surface smooth, shining, deep green, whitish underneath: general length about one foot or fifteen inches.

Petioles (*stipes*) at the base sheathing, the rest subcylindric, tapering a little; while young covered with a large portion of a brown, woolly substance.

Spadix terminal, composed of numerous, alternate, simple, drooping branches; general length of the whole ramose part from one to three feet.

Spathe universal many-leaved. *Leaflets* of various sizes, and of a soft, delicate, leathery texture; striated lengthways; outside covered with brown, meally matter; inside smooth.

Male flowers very numerous over every part of the branches of the spadix, small, pale yellowish white, tinged with pink.

Perianth cylindric, one-leaved, almost solid, (there being only an excavation in the apex for the reception of the corol.) *Margin* marked with three, small protuberances; smooth on both sides.

Corol: Petals three, lanceolate, smooth, fleshy: nothing like a nectary nor germ to be seen.

Filaments six, short, inserted on a small hollow receptacle in the centre of the corol. *Anthers* linear.

Female flowers mixed amongst the male over the branches of the same spadix.

Perianth (may be called) double (in that case,) the *exterior* is of two, reniform leaflets. The *interior* one-leaved, cup-shaped, with the border 3-parted.

Corol as in the male, but with shorter and rather broader peals.

Stamina none; nor is there any nectary.

Germ above, ovate. *Style* none. *Stigma* small, conical, 3-pointed.

Pericarp, a dry, ovate-oblong *berry*, about the size of a nutmeg, one-celled.

Seeds two, ovate-oblong, singly about the size of a large coffee-bean, but longer, flat on one side, convex on the other, with the *embryo* lodged about the middle of the convex side.

OBSERVATIONS.

When the plant has ripened its seed, it perishes; and is succeeded by suckers which rise from the root, as in the common plantain: or may be reared from the seed.

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296. QUERCUS ARMATA R.

Leaves lanceolar, acuminate, entire, smooth. *Cup* an entire evalvular capsule, armed with many compound thorns, hiding completely the subovate acorn.

OBSERVATIONS.

A large timber tree, a native of the mountainous countries immediately east of *Bengal;* at *Chittagong*, it is called Kanta-lal-batana; at *Tipperah Singahara*; and in the forests near *Golparah Kanta Singgur*.

QUERCUS CASTANICARPA.

Leaves oblong, entire, smooth. *Nuts* ovate, with a point, a little hairy, completely hid in the evalvular capsular cup, which is completely armed with numerous strong, ramous, sharp spines.

OBSERVATIONS.

Lumba-kanta-hurrinea-Batana, the vernacular name in *Chittagong;* where it grows upon the hills over that district to be a very large, and elegant tree, with far extended shady branches. Flowers in July and August; and the acorns ripen in the cool season. The wood not esteemed, and used for fuel chiefly.

MODECCA.

MONOECIA MONADELPHIA.

GENERIC CHARACTER.

Calyx tubular, coloured, 5-parted. *Petals* five, inserted into the calyx. *Nectary* various. *Germ* pedicelled, one-celled: *ovules* numerous, insertion parietal. *Capsule*, one-celled, 3-valved. *Seeds* many. *Embryo* inferior-centrifugal, and furnished with albumen.

OBSERVATIONS.

I have adopted Van Rheede's name for a generic one to this family, which, though nearly allied to Passiflora, seem to me to be sufficiently distinct on account of its capsular seed vessel, and monoecious habit.

297. MODECCA TRILOBATA.

Leaves 3-lobed, a gland under each sinus, and two at the base. *Capsule* oblong.

OBSERVATIONS.

Akanda-Phul, the vernacular name in *Chittagong;* where the plant is found in the moist forests, growing to an extent of many fathoms; ramous, and climbing up and over trees of a large size. In the Botanic Garden at *Calcutta*, it grows slow, though healthy; flowers during the rains, and the fruit ripens in October.

DESCRIPTION.

Bark on the old ligneous parts ash-coloured; on the young shoots smooth, polished, green.

Leaves remote, alternate, petioled, smooth on both sides, 3-lobed; *lobes* entire, tapering and acute. *Glands:* a large yellow one under each sinus, and two at the base.

Petioles nearly as long as the leaves, columnar, smooth; base permanent, though not enlarged, as in *M. tuberosa*, and becomes a recurved blunt, short, thorn.

Tendrils axillary, floriferous, when not floriferous simple.

Flowers numerous, male and female annexed on the same tendril, middling sized, forming a little dichotomous corymb, toward the apex of the tendrils.

Calyx tubular, somewhat gibbous toward the base; colour pale yellow; mouth 5-parted.

Petals five, linear-lanceolate, ciliate, inserted on the tube of the calyx near the base. *Nectarial* scales in the *male* none; in the *female* ten; five are alternate with the petals entire and truncated, and five under the petals, smaller and ciliate.

Filaments in the male five, united into a tube. *Anthers* linear, erect.

Germ in the *male* a small 3-cleft gland: in the *female* short-pedicelled, oblong, one-celled; *ovules* many, attached to three vertical, parietal receptacles. *Style* none. *Stigma* 3-lobed.

Capsule pedicelled, berried, oblong, size of a pullet's egg, fleshy, smooth, polished, scarlet colour, 3-valved, opening from the apex.

Seeds many attached, by very thick, soft, fleshy cords to a thickened ridge down the middle of each valve; obcordate, invested in a complete, soft, lucid, aril. *Integuments* two, *exterior* nuciform, dark coloured, scrobiculate; *interior* membranaceous.

Albumen conform to the seed, somewhat glaucous.

Embryo nearly as large as the perisperm, with round, 3-nerved *cotyledons* and short *radicle* lodged at the umbilicus of the seed.

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298. GARCINIA CAMBOGIA.

Willd. 2. *p.* 848.

Leaves broad-lanceolar. *Hermaphrodite flowers* terminal, subsessile, solitary. *Stigma* 8-10-lobed, torulose, 8-10-seeded.

Mangostana Cambogia. *Gært. sem.* 2. 106. *t.* 105.

Coddam-pulli. *Rheed. mal.* 1. *p.* 41. *t.* 24. is probably this very tree, for though Van Rheede says the fruit is on a peduncle an inch long, yet his figure places the leaves close to the terminal fruit, so that it is evident the extremity of the branchlet must have been considered the peduncle. In my G. *zeylanica* the flowers are axillary.

OBSERVATIONS.

This tree grows to be of considerable size in the forests of *Travancore*, where it is known to the natives by the name *Ghorkapuli;* consequently we may conclude it to be *Carcapuli* of Bauhin, Acosta, &c. Flowering time February and March; fruit ripe in June and July.

DESCRIPTION.

Leaves opposite, short-petioled, lanceolar, entire, polished on both sides; length 3-6-inches, and from one to two broad.

Flowers terminal, solitary, subsessile, pretty large, yellow.

Calyx 4-leaved; *leaflets* in two opposite pairs, the exterior pair rather smaller; all are nearly round, of a firm fleshy texture, smooth on both sides and permanent.

Petals four, nearly round, twice the length of the calyx.

Filaments from fifteen to twenty, shorter than the germ, broad towards the base, and there slightly united. *Anthers* roundish,

seem scarce fertile, which, as in all the other species of this genus I have yet met with, induces me to think there is a male tree, though I have not yet met with it.

Germ superior, round, 8-10-lobed, 8-10-celled, with one *ovule* in each, attached to the axis. *Style* none. *Stigma* peltate, with as many ragged divisions as there are cells in the germ.

Berry round, size of a small orange, from eight to ten elevations run from the base to the apex (as in the common *melon*), when ripe yellow, and one-celled.

Seeds generally eight or ten, semi-ovate, with the inner edge thin, each enveloped in its own proper, succulent, yellowish, pulpy aril.

Albumen and *embryo* as in the other species.

OBSERVATIONS.

From wounds a yellowish juice exudes, which hardens into a brownish yellow gum-resin, greatly inferior in colour to *gamboge*.

GYNOCARDIA.

DIOECIA POLYANDRIA.

GENERIC CHARACTER.

MALE.

Calyx 4-5 lobed. *Petals* five, a nectarial scale over the base of each.

FEMALE,

Calyx and *corol* as in the male. *Germ* superior, one-celled: *ovules* numerous, on five parietal receptacles. *Styles* five. *Berry* dry, one-celled, many-seeded. *Embryo* furnished with albumen: direction of the *radicle* various.

299. GYNOCARDIA ODORATA.

OBSERVATIONS.

Chaulmoogri, or Chawulmoogri; also Petarcurrah, are the names by which this tree, and the drug, hereafter mentioned, which it furnishes, are known in the *Silhet* district, where it is indigenous, and grows to a large size, equalling the largest mango trees, (and their size, when full grown, may be compared to the great maple, or sycamore, *Acer pseudo-platanus*.) Blossoms in April and May; and the seed ripen about the close of the year; when the fruit is gathered, the seed carefully taken out, dried, and sold to the native dealers in drugs for about five rupees the maund, of 84lbs.

DESCRIPTION.

Trunk and large *branches* covered with tolerably smooth ash-coloured bark: the young shoots more or less declinate, round, smooth and green. *Wood* of a light brown colour, close-grained, and seems very fit for a variety of purposes.

Leaves short-petioled, alternate, bifarious, drooping, lanceolate, entire, acuminate, smooth; from six to ten inches long, and from one and a half to two and a half broad.

Stipules none.

Peduncles from the sides of the ligneous branchlets of from one to several years growth, generally several together, from one to two inches long, one-flowered.

Bractes minute, round the base of the peduncles.

Flowers large, about an inch and a half in diameter when expanded, pale yellow, and powerfully fragrant.

Calyx one-leaved, bowl-shaped; *border* 4-5-lobed.

Petals five, sessile, oblong, inserted into the receptacle round the filaments. *Nectary:* five ciliate, oblong scales, or smaller petals, of a deeper yellow colour over the lower half of the proper petal, and attached to them.

Filaments numerous (about one hundred), woolly, inserted into the disk of the receptacle. *Anthers* linear, erect, about the length of the filaments, and the two together rather shorter than the petals.

Germ none.

FEMALE, on a distinct tree.

Peduncles in bundles from tuberosities over the trunk, and larger branches, one-flowered, &c. as in the male.

Flowers larger than the male, and fragrant.

Calyx, *corol* and *nectary* as in the male.

Stamina none, but round the base of the germ are inserted about ten pinnatifid, villous bodies.

Germ superior, round, slightly five-lobed, one-celled, and contains numerous *ovules*, attached to five parietal receptacles, as in Jussieu's *Capparides*, to which this will, no doubt, belong. *Styles* five, short. *Stigmas* large sagittate-cordate.

Berry globular, size of a shaddock, one-celled. *Cortex* thick, rough, ash-coloured, surface internally brown and composed of radii pointing to the centre of the berry. *Receptacle* in the ripe state uncertain.

Seeds numerous, size of large filberts, immersed in pulp, shape various, but in general nearly oval, smooth, light-gray. *Integuments* two: *exterior* subnuciform: *interior* membranaceous.

Albumen conform to the seed, fleshy, whitish-gray.

Embryo white. *Cotyledons* subreniform. *Radicle* oval, direction various.

OBSERVATIONS.

The seeds of this tree, called Chaulmoogri, or Petarcurrah by the natives, are employed by them in the cure of cutaneous disorders. When freed from the integuments, they are beat up with clarified butter, into a soft mass; and in this state applied, thrice a day to the parts affected.

300. MUSA GLAUCA.

Root fibrous, and perishes with the columnar stem. *Spadix* drooping: *spathes* ovate-lanceolate, imbricated, many (10-20) flowered, permanent, those of the male-hermaphrodite flowers withering.

OBSERVATIONS.

A very stately, elegant, perfectly distinct, strongly-marked species; a native of *Pegu*; and from thence introduced, by the discoverer, the Rev. Mr. F. Carey, into the Botanic Garden at *Calcutta*, where it blossoms in May, and the seed ripen in October and November. Like my *M. superba*, it never produces suckers,

Curcuma Zerumbet

Gratiola lucida

Gratiola parviflora

Gratiola rotundifolia

Hippocratea arborea.

Panicum squarrosum.

Boswellia glabra

Garuga Pinnata.

Hardwickia binata

Hopea odorata

Carallia lucida

Shorea robusta

Dipterocarpus turbinatus

Bignonia suberosa

Kydia calycina

Krydia paterna

Careya herbacea

Careya arborea

Erythrina arborescens

Erythrina resupinata

Cylista tomentosa

Flacourtia inermis

Musa superba

Terminalia procera

Mimosa Sundra

Amomum Cardamomum

Globba pendula

Globba orixensis

Globba radicalis

Scirpus tuberosus

Saccharum sinense

Hydrophylax maritima

Trapa bispinosa

Porana paniculata

Spermadictyon suaveolens.

Morinda angustifolia

Cedrela Toona

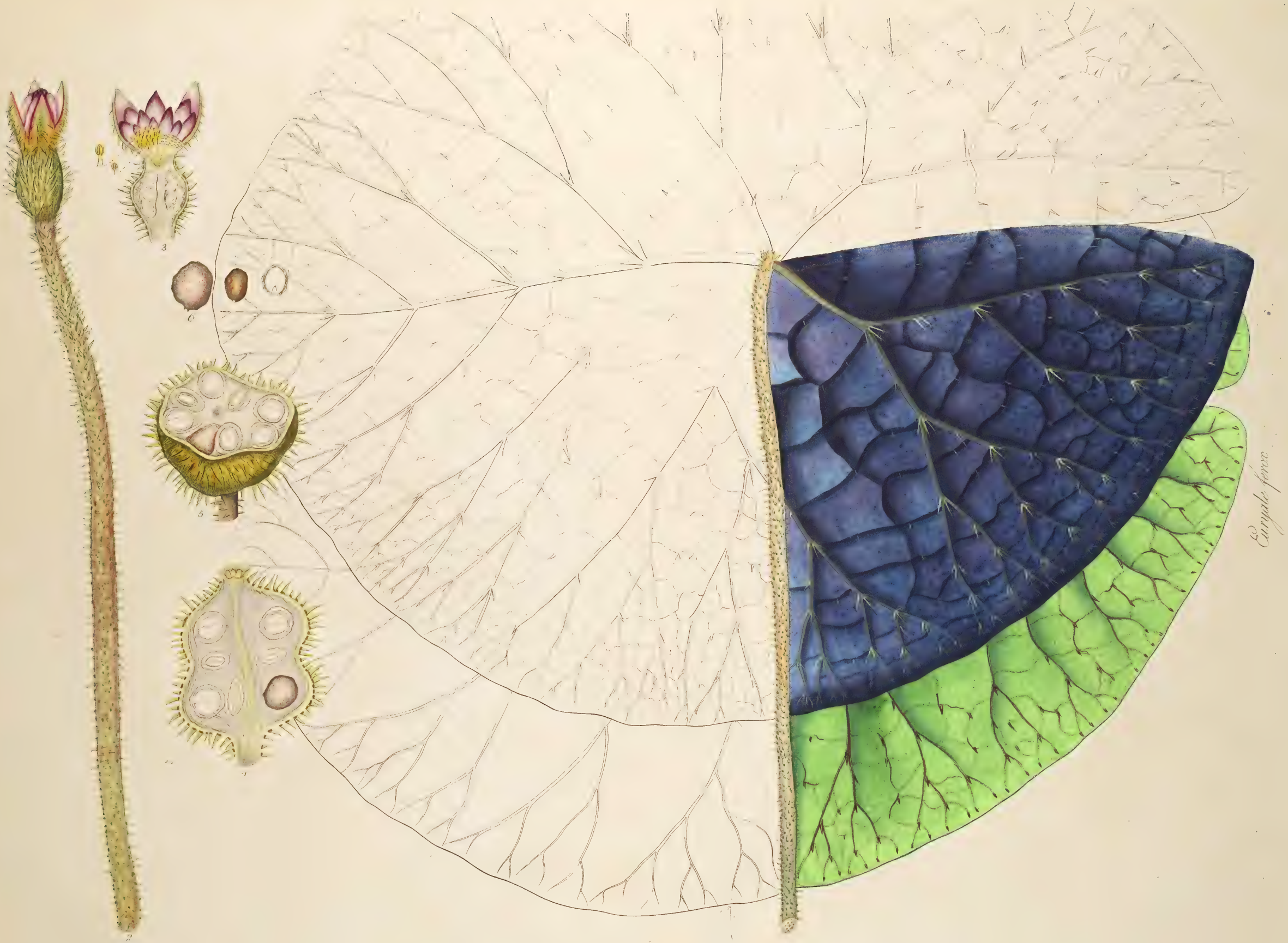
Asclepias tingens

Asclepias tenuissima

Stapelia umbellata

Barmannia distichia

Bambusa lanigera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6
5
Euryale ferox

Colebrookia ternifolia

Gardenia arborea

Bombax heptaphyllum

Flemingia stricta

Flemingia semialata

Artocarpus integrifolia

Hedychium angustifolium

Alpinia costata

Gran sculp

Zingiber ligulatum

Millingtonia simplicifolia

Curtis del.

Corypha Taliera

Corypha Taliera

Girin Sculp

Tacca integrifolia

Amoora cucullata

Girón sculp

Sodalyria bracteata

Heynea trijuga

Sandoricum indicum.

Waddell sc.

Buchanania angustifolia.

Curtis, sculp.

Inocarpus edulis

Berria Ammonilla.

Weddell sc.

Brownlowia elata

Magnolia pterocarpa

Lepidagathis cristata

Pistia Stratiotes.

Weddell sc.

Gossypium herbaceum.

Weddell sc.

Xanthochymus. dulcis

Curtis sculp

Aerides multiflorum

Curtin sculp

Arum campanulatum

Phœnix acaulis

Myristica aromatica.

Weddell Sc.

Musa sapientum

Alpinia linguiformis.

R. B. Penke sculpt

Amomum subulatum.

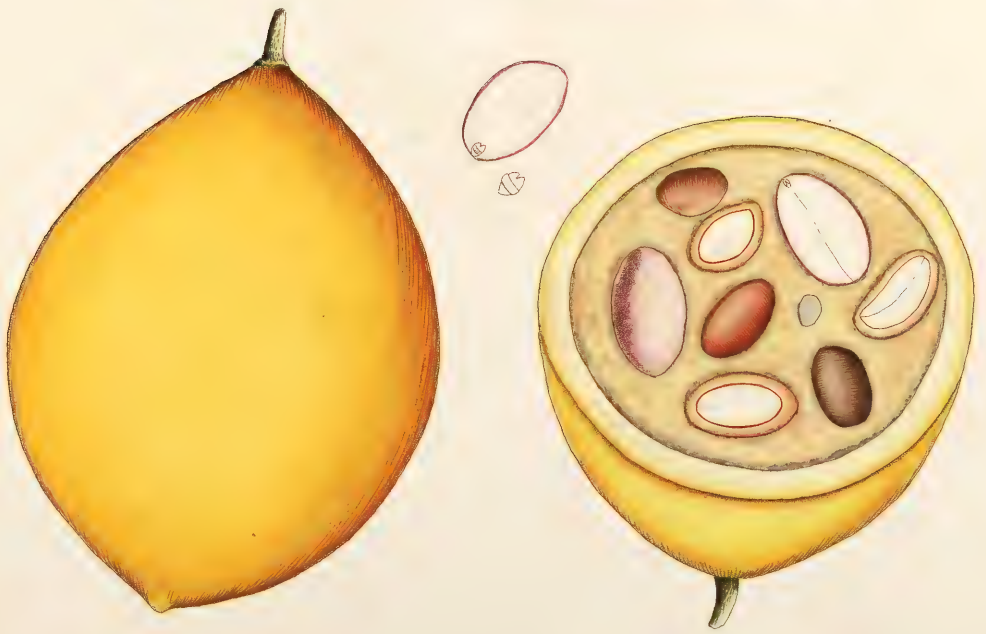
R. B. Drake sculpt

Kæmpferia ovalifolia.

R. B. Peake sculp.

Latrympelia pomifera?

A. B. Peale sculp.



Willughbeja edulis.

R. B. Beake sculpt.

Echites grandiflora.

R.B.Peake sculp.t

Holigarna longifolia?

R. B. Beake sculpt

Marlea begonifolia.

R B Peake sculp.

1. *Xanthophyllum virens* 2. *Xanthophyllum flavescens.*

R. B. Peake sculpt.

Bauhinia anguina.

R. B. Peake sculp!

Cynometra polyandra

R. B. Peake sculpt

Sterculia alata.

Weddell Sc.

Vateria indica.

Roydsia suaveolens.

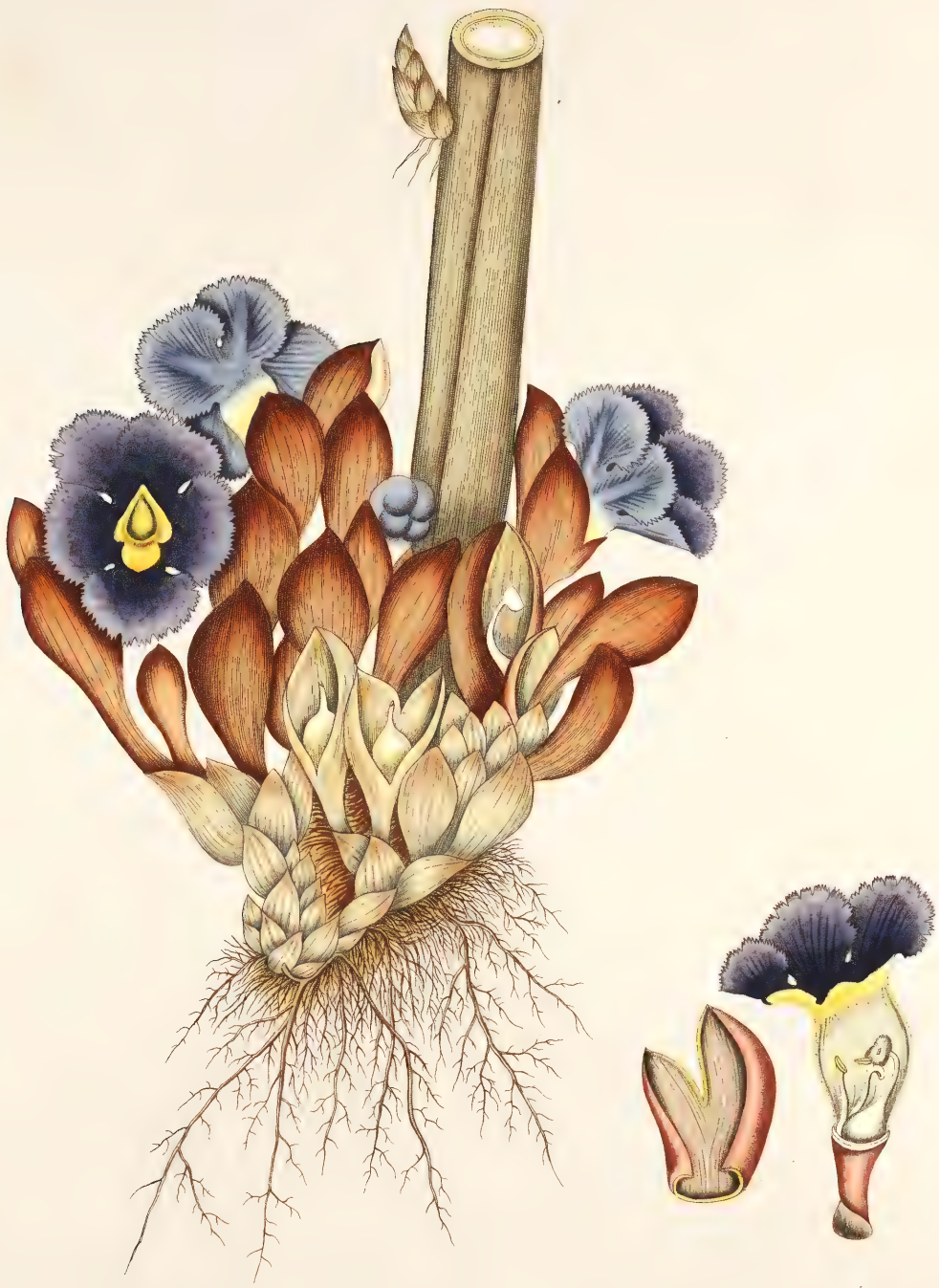
R. B. Peake sculp.

Unona longiflora.

Weddell Sc.

Incarvillea parasitica.

R B Peake sculp!



Orobanche acaulis.

Weddell Sc.

Gongora tomentosa.

R. B. Peake sculpt.

Ambrosinia ciliata.

R.B.Peake sculp!

Wallichia caryotoides.

Weddell Sc.

1. Quercus armata. *2. Quercus castanicarpa.*

Modecca trilobata.

Weddell. Sc.

Garcinia Cambogia.

Waddell Sc.

Gynocardia odorata.

Weddell Sc.

Musa glauca.

Weddell Sc.

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P. 51, n. 255, and in running titles of p. 52 and 53, *for* CORYPHEA, *read* CORYPHA.